NOVEMBER 5, 1936

THE IRON AGE

A most versatile material

ENDURO

REPUBLIC'S PERFECTED
STAINLESS STEEL

RUST-RESISTANT
CORROSION-RESISTANT
HEAT-RESISTANT
HIGH CREEP STRENGTH
STRONGER THAN ORDINARY STEEL
CLEAN AND SANITARY
EASY TO KEEP CLEAN
BEAUTIFUL—EYE-APPEALING
EASY TO FABRICATE
EASY TO MACHINE
ALL COMMERCIAL SHAPES
WIDE VARIETY OF FINISHES
MORE THAN 50 ANALYSES

Write for Full Details

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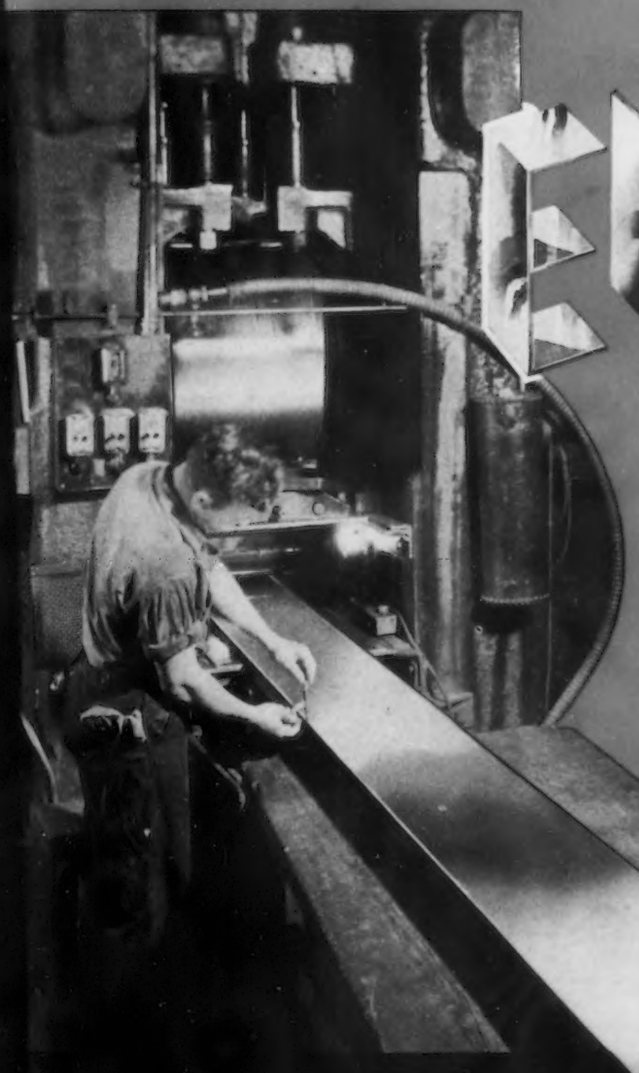

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REPUBLIC STEEL

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• **Comprehensive**—Here—ready for instant reference—is the definite, specific information you need to specify and order quality Phosphor Bronze, in any of its various forms.

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COMPANY .....

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I. A. 11-3

ELEPHANT BRAND PHOSPHOR BRONZE

Winners—

SEE PAGE 82 NOVEMBER 7TH SATURDAY EVENING POST

Out of the broad experience of Ludlum engineers and metallurgists has grown a valuable store of knowledge of fine steels—authoritative data on selecting the best grade and physical properties for each particular purpose, as well as on methods of working and heat treating.

And in every branch of industry where resistance to heat, corrosion, wear or shock demands superior service Ludlum fine steels are regularly giving exceptional performance.

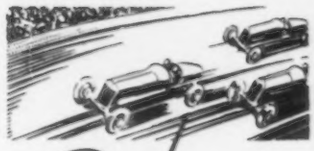
No matter how advanced your ideas or plans for changes or improvements in products or methods, Ludlum is ready to cooperate. Investigation of Ludlum products and service may pay you worth while dividends.

Write, wire or 'phone Research Dept., Ludlum Steel Company, Watervliet, N. Y.

LUDLUM

FINE STEELS SINCE 1854

TOOL · STAINLESS · CARBON · ALLOY



Victory for LOUIS MEYER and LUDLUM SERVICE

Louis Meyer, Winner, Indianapolis 1936

Ludlum—whose engineers and metallurgists worked with Louis Meyer—know that skillful designing as well as superb driving carried him to a new speed record and made him the first Indianapolis three time winner.

In this arena of hard knocks, Ludlum Nitralloy and other fine steels more than stood up. Such performance is rapidly leading to increased use of Ludlum steels and service not only in passenger cars and trucks but in all branches of industry. Silcrome valves are today standard equipment on the vast majority of motor car, airplane, truck, bus, motorcycle, marine and Diesel motors.

A new, illustrated Ludlum booklet contains further interesting facts about Louis Meyer's winning car, and other examples of the unusual service Ludlum engineers and metallurgists are performing to speed the progress of modern industry in many fields.

A postcard will bring your free copy. Just ask for "Performance": address Ludlum Steel Co., Watervliet, N. Y.

A New Free Booklet

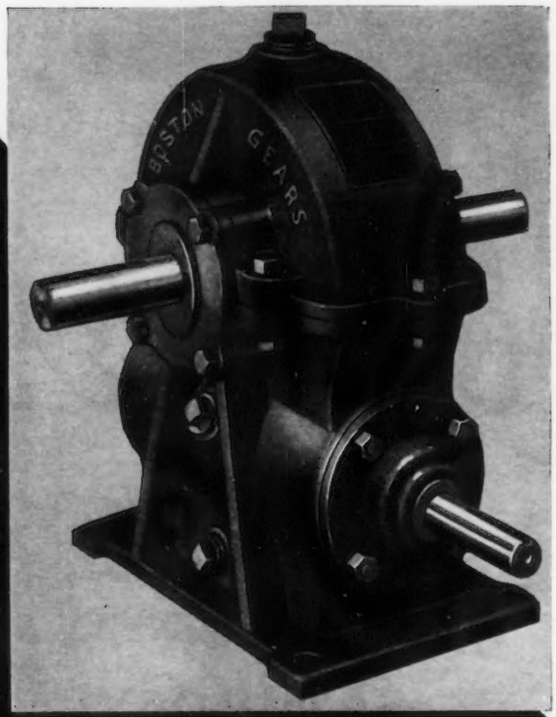
Makers of fine Steels since 1854

LUDLUM

TOOL · STAINLESS · CARBON · ALLOY

THE IRON AGE, published every Thursday by the *CHILTON CO., (INC.)*, Chestnut & 56th Sts., Philadelphia, Pa. Entered as second class matter November 8, 1932, at the Post Office at Philadelphia under Act of March 3, 1879. $6.00 a year in U. S., Canada $8.50, Foreign $12.00. Vol. 138, No. 19.

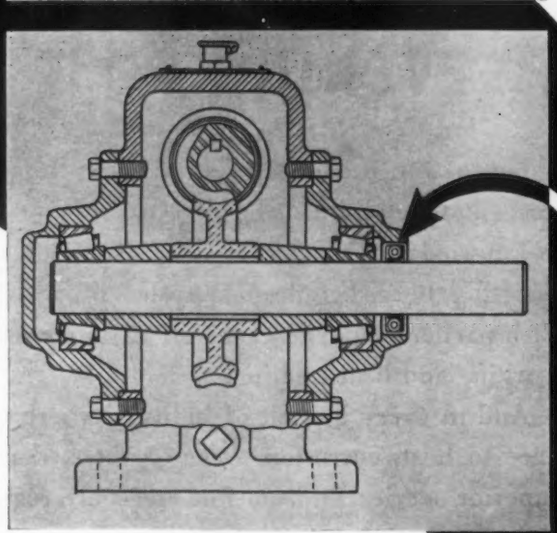
No lubricant loss tolerated

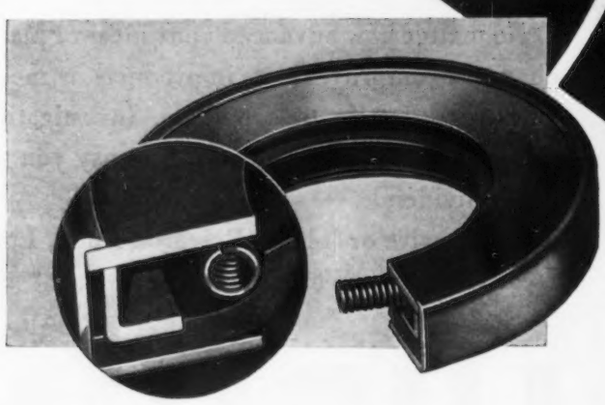


THE Boston Gear Works, Inc., in their worm gear Speed Reducer, have taken every precaution to assure the user long satisfactory service. Recognizing that the life of a speed reducer depends entirely on the proper operation of its bearings and gears, this company uses the most effective means to prevent loss of lubricant and contamination.

Chicago Rawhide "Perfect" Oil Retainers are used in the bearing housings of both high and low speed shafts. Thus no lubricant can escape at either point and no dust, moisture or foreign matter can enter the housings. Hazardous oil drip is eliminated.

This is only one of the thousands of applications of "Perfect" Oil Retainers to industrial equipment of all kinds. If your equipment is not so protected write for suggestions.





PERFECT Oil Retainer

PATENTED

CHICAGO RAWHIDE MANUFACTURING COMPANY

1306 ELSTON AVENUE • CHICAGO, ILLINOIS

57 Years Manufacturing Quality Mechanical Leather Goods Exclusively

PHILADELPHIA CLEVELAND NEW YORK DETROIT BOSTON PITTSBURGH CINCINNATI

GIVE YOUR CUSTOMERS GREATER DOLLAR VALUE . . . *At Less Cost*

A typical example of how this was accomplished in the shops of the R. G. Haskins Company.

Here is the story in their own words.

TELEPHONE COLUMBUS 2870

R. G. HASKINS COMPANY

MANUFACTURERS AND DISTRIBUTORS OF
FLEXIBLE SHAFT MACHINERY
HIGH SPEED TAPPING EQUIPMENT

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August 1, 1936.

The Warner & Swasey Company
Cleveland, Ohio

Gentlemen:

Our turret lathe work must be very accurate, owing to the terrific high speeds at which our machines must operate. We are using your Warner and Swasey High Speed Turret Lathes successfully and economically on all our runs from 10 to 200 pieces, holding tolerances up to .0004".

Our methods are simple and can be used by anyone. There are no secrets or stunts and the answer is good machines, good tools and good men to operate them. Combining these three gives us exceptionally fine work at a minimum cost. Inspection and second operations have been practically eliminated and each man is his own inspector. They work on a weekly, rather than an hourly basis, and are paid above average with each man responsible for the condition of his machine. This has been our policy for years. It has reduced the cost of our product and improved its quality.

Small lot jobs held to close tolerances generally require strict supervision. Our plan works just the opposite. We have very little supervision, almost no inspection, yet rarely do we have any spoilage or scrap loss and our tool and maintenance costs are very low.

Again I say, good machines, good tools and good men to operate them is the answer to giving your customer a better product at less cost.

Sincerely yours

H. Goldberg

H. Goldberg

There is a way to reduce your turning costs too.

The solution lies in a careful analysis of your turning methods. Your local Warner & Swasey representative is the man to work with. Let him make his suggestions and recommendations. Make your product better than you have to and pay less for it.

WARNER & SWASEY *Turret Lathes* **CLEVELAND**

TEXACO

GEARS register improvements

You find Texaco at work everywhere—in the power-houses, in the machine-shops, in gear-driven equipment.

One notable example of Texaco at work is the performance of Crater in lengthening the life of gears.

This lubricant cushions gear teeth in a pressure-proof, wear-defying film that resists the wiping action of gears in mesh. Reduces nerve-racking gear noise. It *clings* to metal surfaces, lasting several times as long as ordinary lubricants.

Apply Crater and experience a quieter, more trouble-free, dependable performance from your gear-trains. The Texaco-trained representative will be glad to provide practical engineering service to prove the economies of Texaco Products.

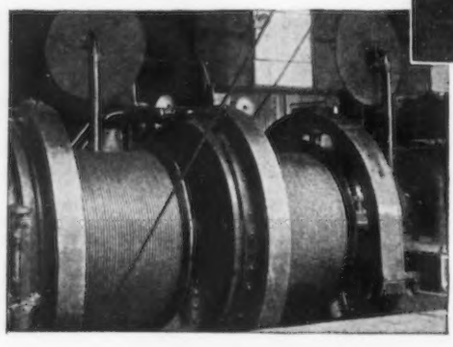
☆ ☆ ☆

THE TEXAS COMPANY

135 East 42nd Street • New York City

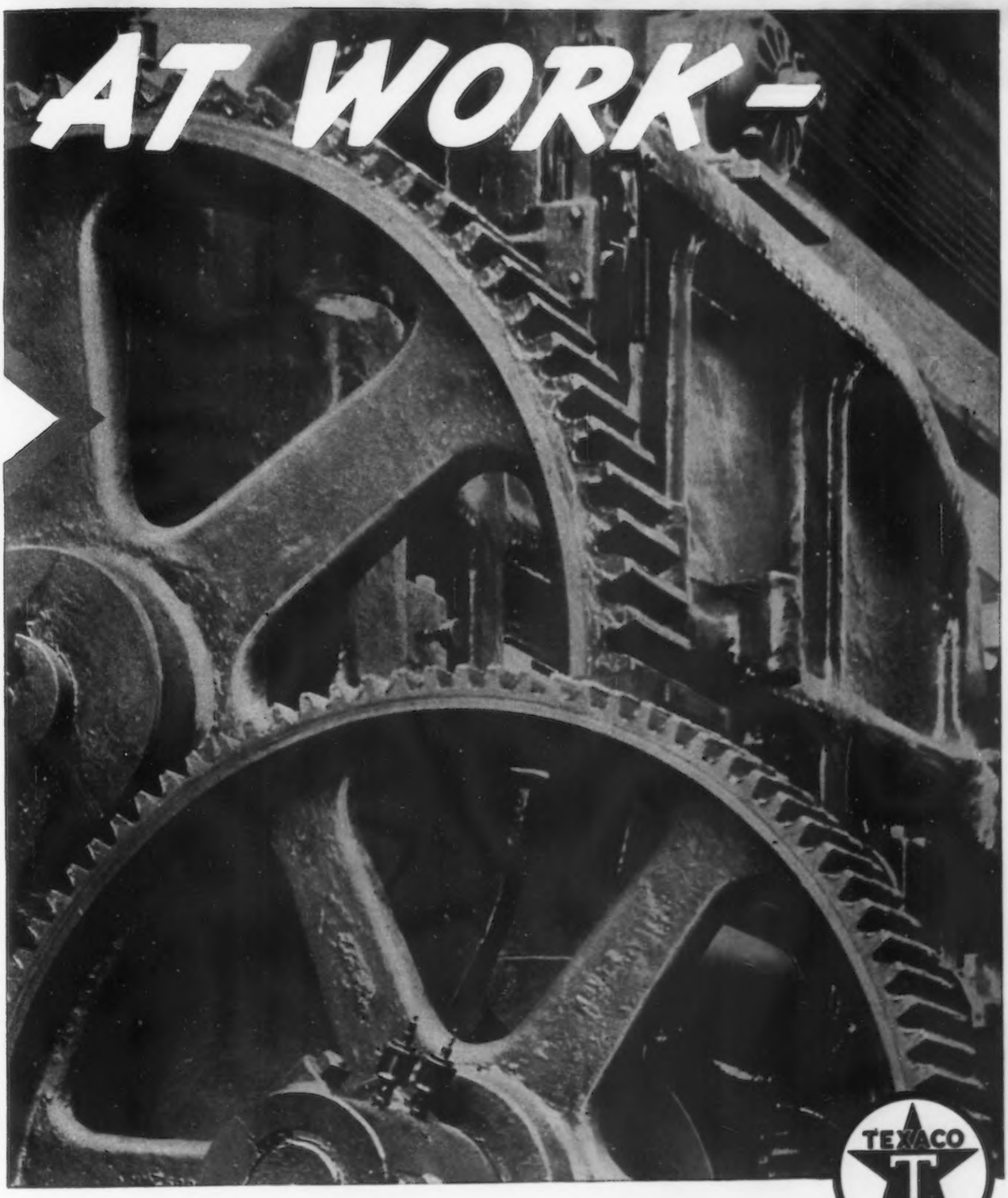
Nation-wide distribution facilities assure prompt delivery

READ THIS BOOKLET—32 pages of money-saving information for all who operate gears or wire rope. Shows where to use Crater and how. Illustrates simple devices for applying Crater to wire rope. Write for your free copy.



FOR WIRE ROPE—Crater seals each wire of each strand in a tough, viscous, waterproof coating that clings despite high speed, heavy loads, in hot or cold weather. Remarkable for slushing idle, exposed machinery to protect against rust and corrosion.

VISIT THE TEXACO EXHIBIT—POWER SHOW—GRAND CENTRAL PALACE, N. Y., NOV. 30 to DEC. 5—BOOTH 282



TEXACO
Industrial Lubricants

As the Finer Cars of 1

1937 make their bow

give a thought to the better steels that helped to make them possible

SOON they'll roll back the curtain on the 1937 automobiles. What does the public expect?

Advances in styling? Mechanical and engineering improvements? Refinements in finish and accessories? Yes, they expect all of these. For the history of automobile development has taught the car buying public that each year they can anticipate always more value for their dollars—finer appearance—increased safety—greater comfort and convenience—better performance. And they have never been disappointed.

Each year this challenge, of a public never satisfied with last year's best, faces the automotive technician—puts new demands upon the resources of Steel. This year is no exception.

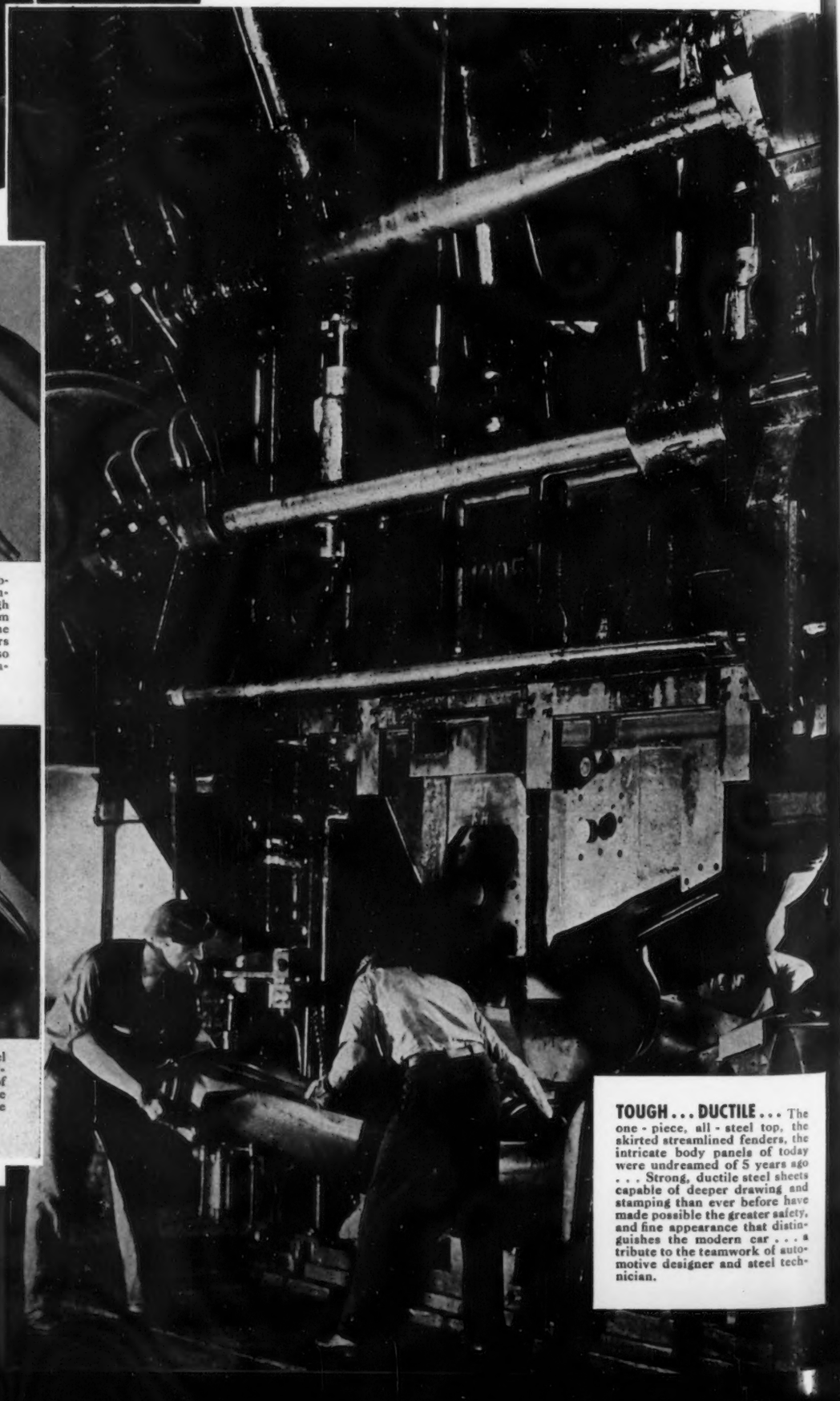
From the drawing boards of automotive designers—from automobile plants geared to stepped-up schedules has come the demand for special steels of infinite variety. Steels to meet requirements ever more specific and exacting. Steels to increase strength. To lengthen the useful life of parts. To decrease weight. To solve assembly problems. To cut costs. More steel than ever before enters into the cars built for 1937.

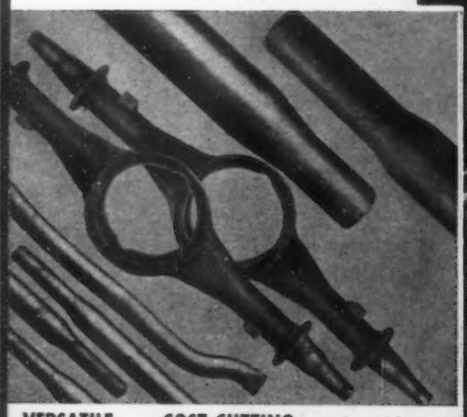
United States Steel Subsidiaries have specially prepared to make the automotive manufacturer's job easier, more profitable. 1700 steel technicians (metallurgists, scientists, researchers), 81 steel research laboratories—the fastest continuous strip mill on earth—a completely modern alloy mill devoted exclusively to the production of alloy steels — a corps of metallurgical engineers trained and experienced to interpret your needs in terms of steel. These are representative of the service United States Steel Subsidiaries place at your disposal.

AMERICAN STEEL & WIRE COMPANY, *Chicago and New York* . . . CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago* . . . COLUMBIA STEEL COMPANY, *San Francisco* . . . NATIONAL TUBE COMPANY, *Pittsburgh* . . . TENNESSEE COAL, IRON AND RAILROAD COMPANY, *Birmingham* . . . COLUMBIA STEEL COMPANY, SAN FRANCISCO, *Pacific Coast Distributors* . . . UNITED STATES STEEL PRODUCTS COMPANY, NEW YORK, *Export Distributors*

UNITED STATES STEEL

From these





VERSATILE . . . COST CUTTING . . . The automobile parts shown here are made of Shelby Seamless Mechanical Tubing, in both alloy and high carbon grades . . . heat treated to assure maximum strength with least possible weight. Made by the National Tube Company, SHELBY has for years been "tops" in mechanical tubing. It fabricates so easily—minimizes grinding and machining operations, cuts tool and labor costs.

PERMANENT BEAUTY . . . USS Stainless Steel in hub caps, window trim, lamp shells, body moldings, etc. gives fine cars a distinguishing touch of beauty and refinement that remains immune to time and weather. The lasting good looks it imparts are a potent aid to sales.

TOUGH . . . DUCTILE . . . The one-piece, all-steel top, the skirted streamlined fenders, the intricate body panels of today were undreamed of 5 years ago . . . Strong, ductile steel sheets capable of deeper drawing and stamping than ever before have made possible the greater safety, and fine appearance that distinguishes the modern car . . . a tribute to the teamwork of automotive designer and steel technician.

USS STEEL

STEELS ... *Better,*

Stronger, More Efficient...

come Easier Fabrication, Smooth Performance, Longer Service ... more value per dollar spent

WE are as proud of the new automobiles as if we had made them ourselves. We are pleased with the part we have had in making them possible. At the same time, we feel a certain sense of obligation to the automotive industry. For the fast pace that automotive designers have set for us—their constant demand that the steel maker do the seemingly impossible, has continually challenged our ingenuity and ability. It has stimulated our steel craftsmen and metallurgists to produce outstanding developments and improvements in steel that today make it possible for us to offer to *all* industry an ever growing list of special steels for special purposes.

Here are steels that in a thousand different applications will make equipment more efficient, longer lasting, lighter, less expensive to operate, cheaper to manufacture. Here are steels that enable us to say "Tell us what the steel must do ... and we'll provide the steel that will do it at lowest cost."

USS CARILLOY STEELS: This new name, identifying controlled alloy steels produced by Carnegie-Illinois Steel Corporation, means quality alloy steels made to your specification. Back of the name are special mill facilities—steel craftsmen trained specifically for alloy steel production—exact metallurgical control. Keep this name in mind. It is your assurance of quality, your guarantee that your product will perform in service as it should.

USS CONTROLLED STEELS are carbon steels for forging, forming, heat treating and machining in which all quality factors can be definitely predetermined ... steels in which the physical properties are consistently uniform. Scientific metallurgical control eliminates those "mysterious differences" which make it so difficult to obtain uniform results with ordinary steels.

USS HIGH TENSILE STEELS: Broadly speaking, USS COR-TEN and USS MAN-TEN can be applied to effect operating economies, to increase strength or to prolong life, in practically every kind of mobile equipment. What these pioneer High Tensile Steels have done to modernize transportation equipment, through weight reduction, is already a matter of record.

USS STAINLESS STEELS: No other metal can even approach stainless steel in strength and permanence. This makes possible the use of lighter sections that eliminate needless pounds and needless cost. By specifying USS Stainless Steels you can cut depreciation costs, practically eliminate corrosion.

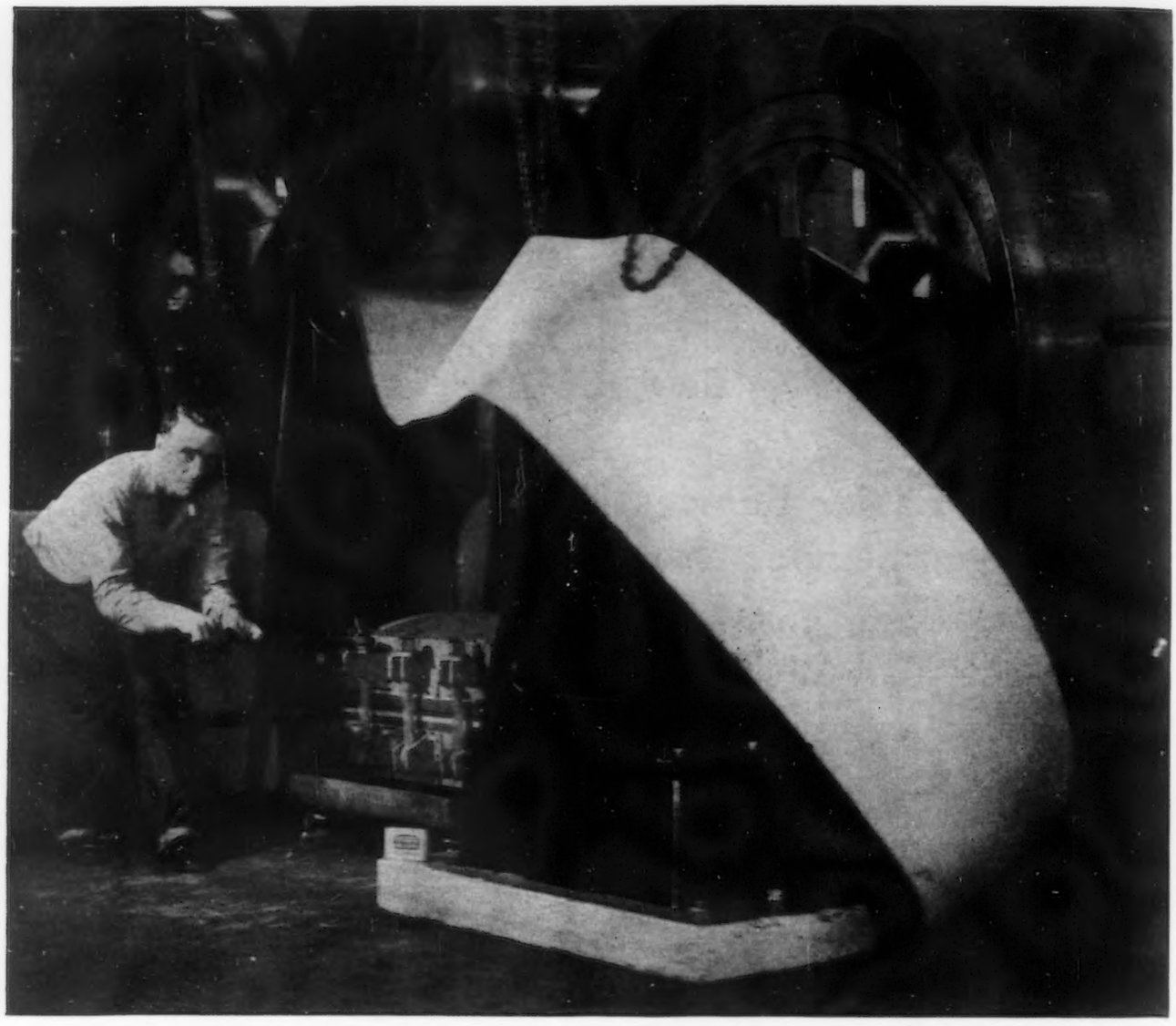
USS A R STEEL: There is no better low-cost solution to abrasion problems than USS Abrasion Resisting Steel. Even though initial cost is comparatively low, it has stood up better in some installations than 11/14% manganese steel and other high priced materials. More than 68% of the present sales volume is repeat business—proof that A R Steel is doing a real job where abrasive conditions are severe.

MATCHLESS DEPENDABILITY ... Fabricat from USS Carilloy, these gears represent but one the many uses for alloy steels. Whenever you ne special steels for special or exacting purposes steels to resist corrosion, steels that achieve hi strength at light weight, steel that must be strong high temperatures, or strong in cold weather—U Carilloy Quality Steels are ready for your use. Th assure uniform results in fabrication, dependab performance of your product in service.

INFINITE IN VARIETY ... Springs large enou to support a railroad car, springs smaller than tho used in a watch are manufactured by the Americ Steel & Wire Company. More than a hundred yea of wire making experience assures their uniform high quality.

AMERICAN STEEL & WIRE COMPANY, *Chicago and New York* ... CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago* ... COLUMBIA STEEL COMPANY, *San Francisco* ... NATIONAL TUBE COMPANY, *Pittsburgh* ... TENNESSEE COAL, IRON AND RAILROAD COMPANY, *Birmingham* ... COLUMBIA STEEL COMPANY, SAN FRANCISCO, *Pacific Coast Distributors* ... UNITED STATES STEEL PRODUCTS COMPANY, NEW YORK, *Export Distributors*

UNITED STATES STEEL



HE MAKES THE BELT SWALLOW ITS TAIL

A typical example of Goodrich improvement in rubber

FOR 40 years manufacturers tried to find a better way to make rubber belts endless.

Splices, vulcanized like tire repairs, would hold for a short time, then begin to open up at the seams. Plan after plan was tried, each plan designed to make splices *stronger and stronger.* Joints were made which seemed stronger than any other part of the belt! Still they failed.

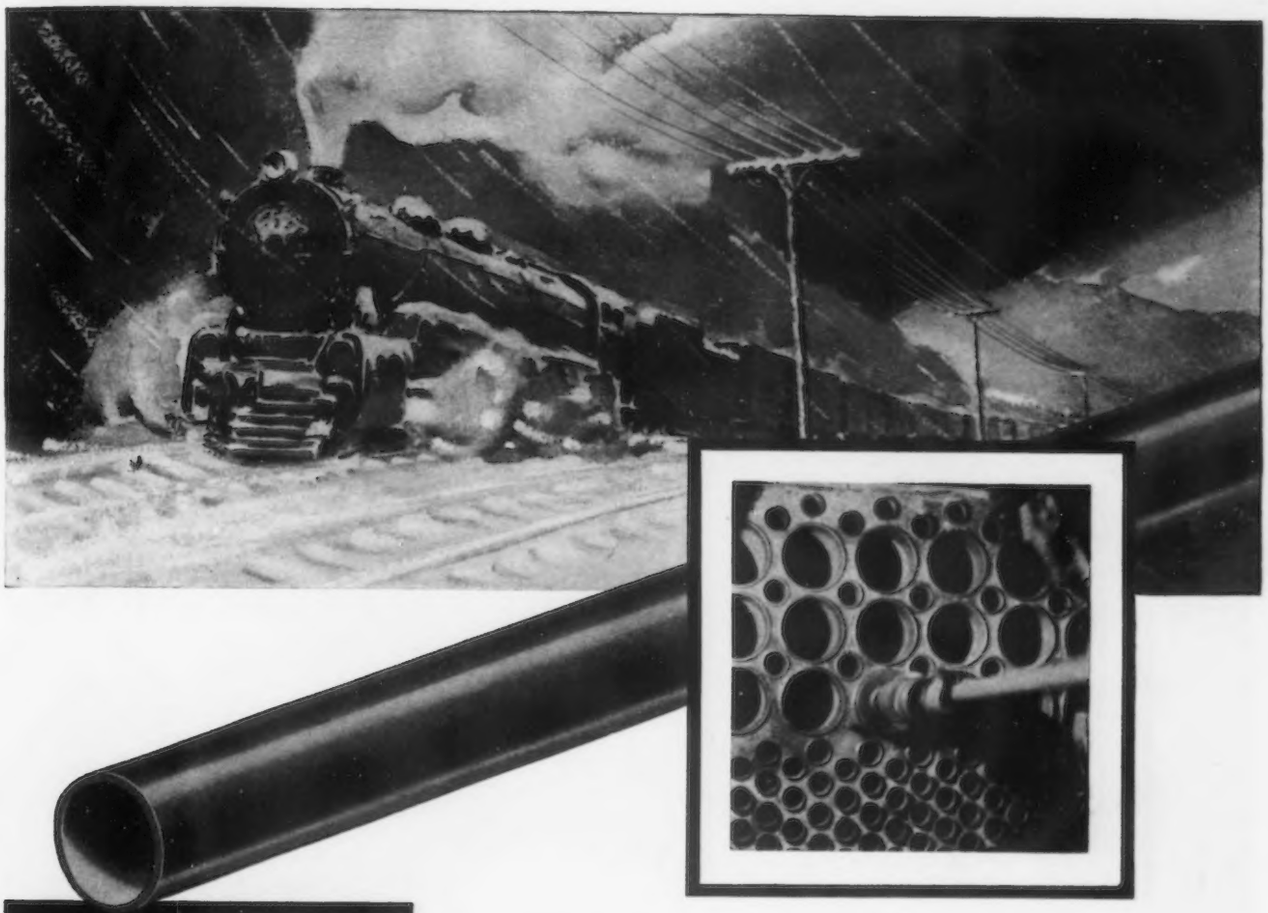
One day Goodrich belt men decided that strength alone wasn't the answer. The outside belt plies must stand quick stretching and relaxing millions of times. Belts travel so fast that air resistance is important. These men decided they must protect those outer seams at any cost. So they reversed the usual engineering procedure, designed a splice in which a small section of an inner ply is removed, the outside ply carried under the surface at the seam, and covered with elastic breaker fabric.

Belts with this new splice lasted sometimes twice as long, sometimes ten times as long as the old belts. Users constantly tell us of serious belting problems which have been completely solved.

Goodrich is always busy with development work on rubber products. Much of it applies to new products, new uses —but no product is too "staple" or too *standardized* to get its share of this work. Goodrich improvements in rubber extend to conveyor belts, rubber-lined pipe, steam hose, suction hose—hundreds of other things classed generally as mechanical rubber goods. The B. F. Goodrich Company, Mechanical Rubber Goods Division, Akron, Ohio.

Goodrich

ALL *products problems* IN RUBBER



ELECTRUNITE
REG. U.S. PAT. OFF.
STEEL & TUBES ELECTRIC WELD
BOILER TUBES

OPERATE THROUGH THIS GRUELING GRIND . . .

Compare the conditions under which stationary boilers operate with those encountered in railway service where continual pounding and vibration throw severe stresses on tubes and tube sheets. Then remember that Electrunite Boiler Tubes are operating day and night in this grueling service—and giving such a satisfactory account of themselves that old users are re-ordering and new users are specifying them right along. • These are the features that enable Electrunite Boiler Tubes to save you time and money: They are straight, true to gauge and perfectly round. They slide through the tube sheet more easily—roll in tighter with less effort. They are controlled atmosphere annealed—free from scale—have less tendency to corrode, and therefore last longer. • Any tube that merits growing preference in locomotive service will easily meet even the most rigorous of stationary boiler requirements. Ask us to send you complete descriptive data on Electrunite Boiler Tubes.

See the new controlled atmosphere annealed ELECTRUNITE Boiler Tube at Booth No. 10, Twelfth National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York, November 30th to December 5th.

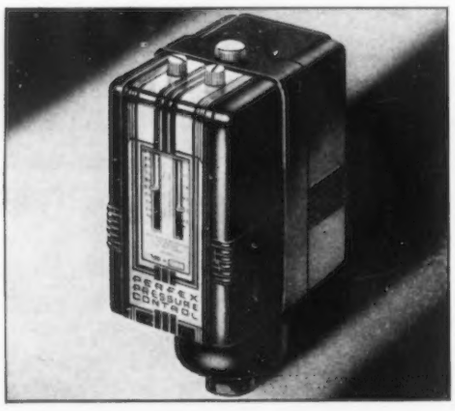
Steel and Tubes *Inc.*
WORLD'S LARGEST PRODUCER OF ELECTRICALLY WELDED TUBING
CLEVELAND . . . OHIO

SUBSIDIARY OF
REPUBLIC
STEEL
CORPORATION

TRIM, compact . . . neat, sanitary . . . light in weight, long in wear—it's a modern housing molded of Durez! Oster Manufacturing Co. picked Durez because: water, wear, perspiration won't dull the finish; it won't conduct heat from the motor; it comes from the mold complete with slots, decoration, shaft-bearing and final finish—saving many production operations. *You* can do it better with Durez, too. Write for information and free monthly "Durez News".

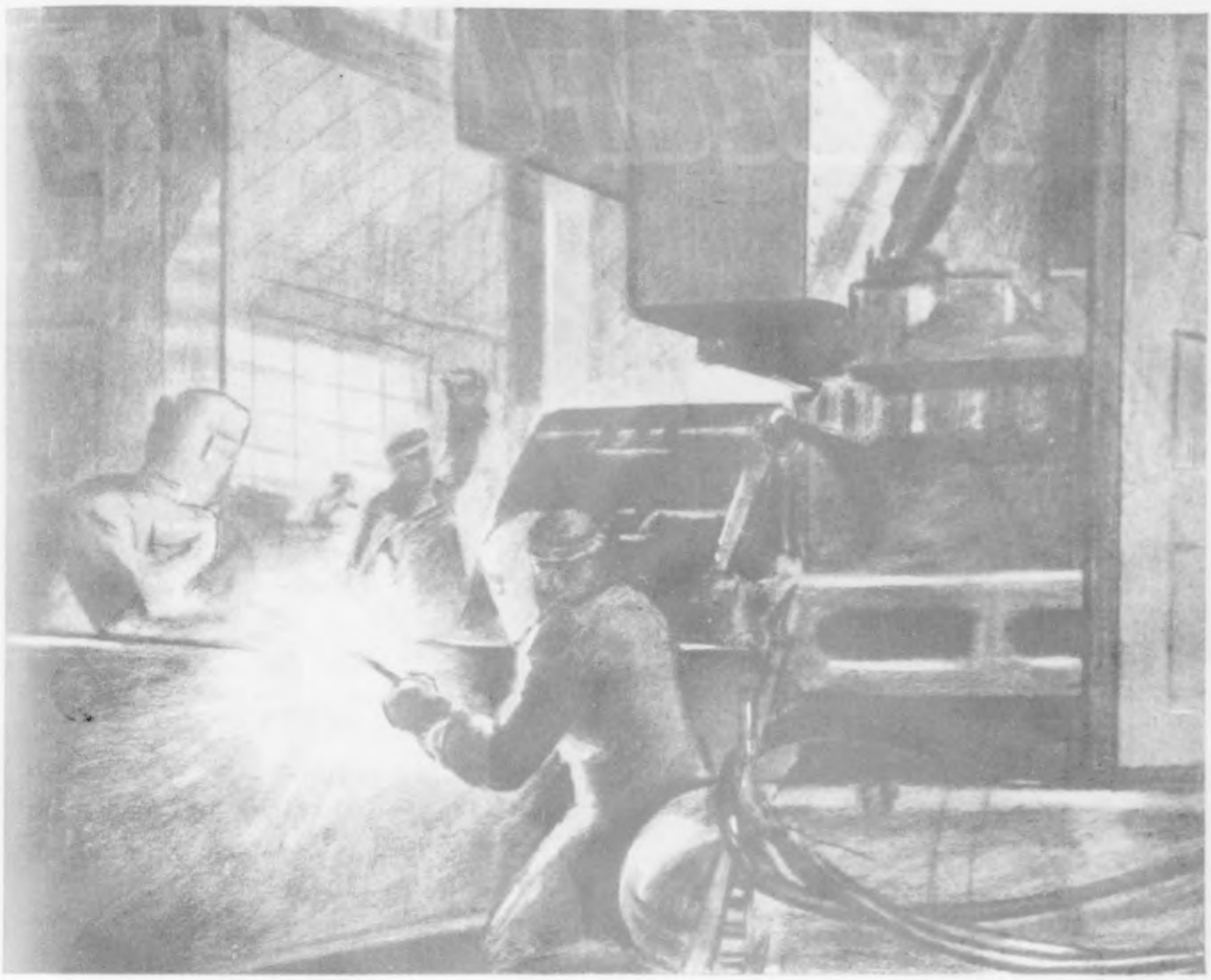
General Plastics, Inc.,
111 Walck Rd., N. Tonawanda, N. Y.

DUREZ



(Left) PERFEX CONTROL CO. present their new Durez housing. It's dust tight, self insulating, cannot chip, scratch or dent. Moisture, steam, and gases cannot damage its lustre or cause it to corrode.

(Right) A NEW IDEA in telephones...the entire base of this new Leich molded telephone is made of Durez. It houses the bell ringing mechanism, thus eliminating the necessity for a separate bellbox. Phone and base are strong and durable...the sleek surface finish will never bloom nor dull.



Paring Useless Tons from Construction Equipment with INLAND Hi-Steel

The use of Inland Hi-Steel (High in Strength, High in Corrosion Resistance) cuts dead weight from 25% to 50% without reducing the strength of the structure.

This new, high strength alloy steel has a minimum yield point of 55,000 to 60,000 lbs.—approximately twice the yield strength of ordinary structural steel—with a minimum tensile strength of 70,000 lbs. This steel can be welded and fabricated readily, and is remarkably uniform in physical properties.

The alloys used in Hi-Steel make it resist corrosion several times longer than Carbon Steel.

The long life of Hi-Steel and the lower tonnage required make it an economical material—both in manufacturing and in operation—both for builder and customer.

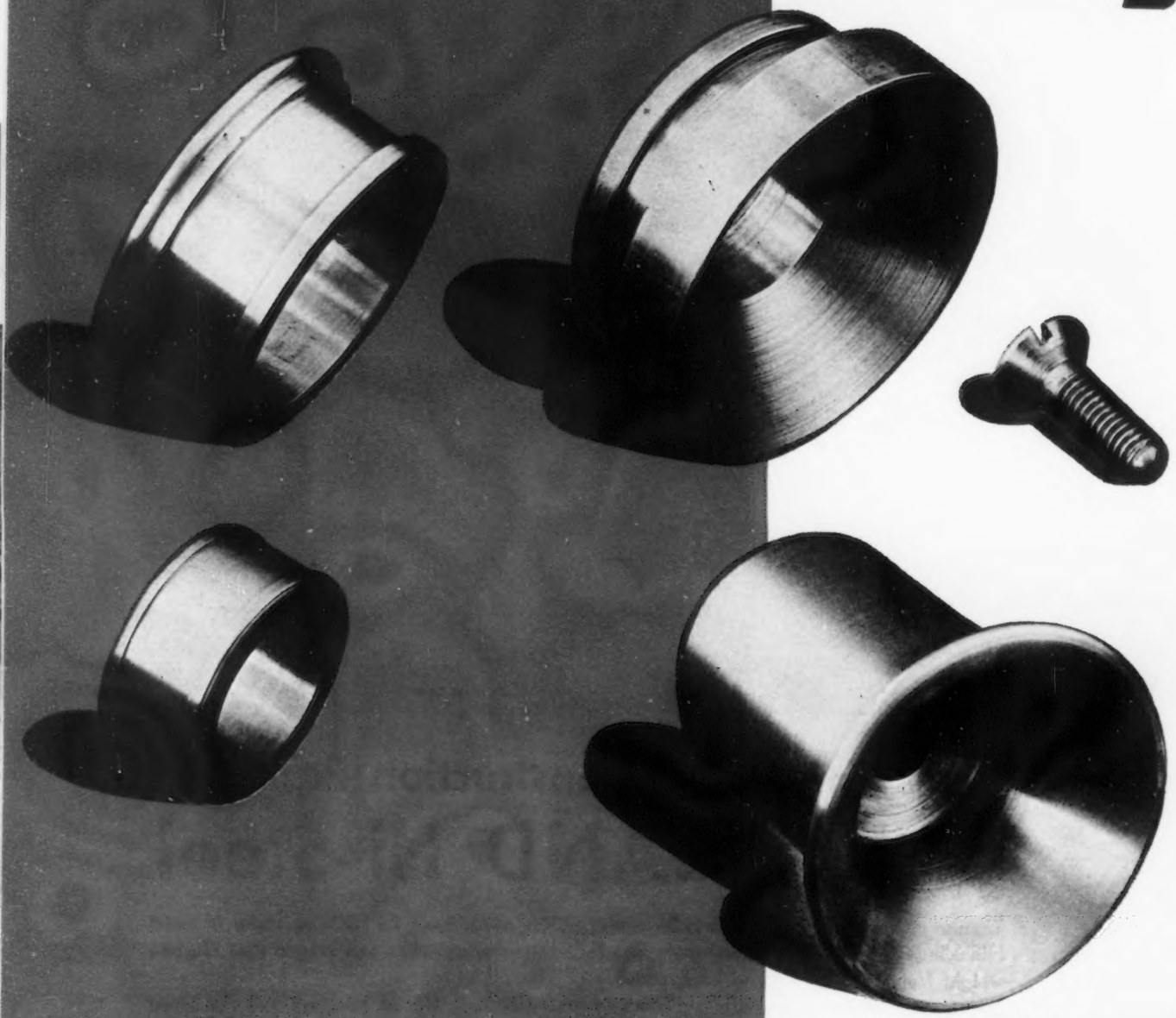
It offers tremendous opportunities for product improvement. Ask for an Inland Metallurgist to help you achieve them and write for Bulletin No. 10.

SHEETS • STRIP • TIN PLATE • BARS • PLATES • STRUCTURALS • PILING • BILLETS • RAILS • TRACK ACCESSORIES

INLAND STEEL CO.

General Offices: 38 South Dearborn Street, Chicago, Illinois

Faster Cutting



more than corrosion resistance

Money saved on every one of these jobs by faster cutting — cleaner machining Carpenter Stainless! The special non-galling and non-seizing properties of this Free Machining Stainless Steel keep the chips from sticking to the tools. Clean machining also means lower finishing costs. Are you saving all that you can on Stainless parts?

Carpenter STAINLESS

Cleaner Machining

this Stainless Steel will do the job Easier!

When the nose of the tool bites into a bar of Carpenter Stainless you can almost "feel" the difference. The chips fall cleaner and faster and the finish is finer and smoother. The easier cutting means less heat, longer tool life, increased output, lower Stainless costs.

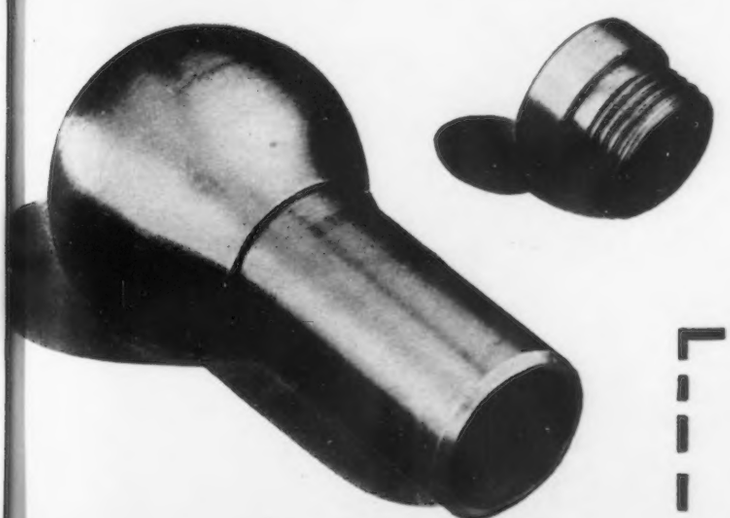
With Carpenter Stainless No. 5—a 14% chrome iron—you can give your product all the advantages of Stainless Steel with the machining economy of ordinary screw stock.

For those parts that demand maximum corrosion resistance—Carpenter Stainless No. 8—an 18-8 chrome nickel steel—holds down machining costs. Selenium, a recent Carpenter development, makes this tough steel freely machineable at 60% to 70% of the speed of ordinary screw stock.

And in actual service, these Carpenter Stainless Steels work more freely on metal-to-metal contacts and are less likely to scratch or gall.

If you are using Stainless Bar stock—find out how much easier you can do the job with Carpenter Free Machining Stainless Steel. And if you have stayed away from Stainless because of cost or working difficulties—remember Carpenter Stainless has licked many an "impossible" job. Try it!

The Carpenter Steel Company, Reading, Pa.



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Carpenter Stainless Steel is supplied to meet U. S. Navy, Aeronautical and Army specifications. Just tell us what specifications you have to meet.

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121 EAST BERN ST., READING, PA.

Please send me your Free Illustrated Book, "Working Data and Technical Facts on Carpenter Stainless Steels."

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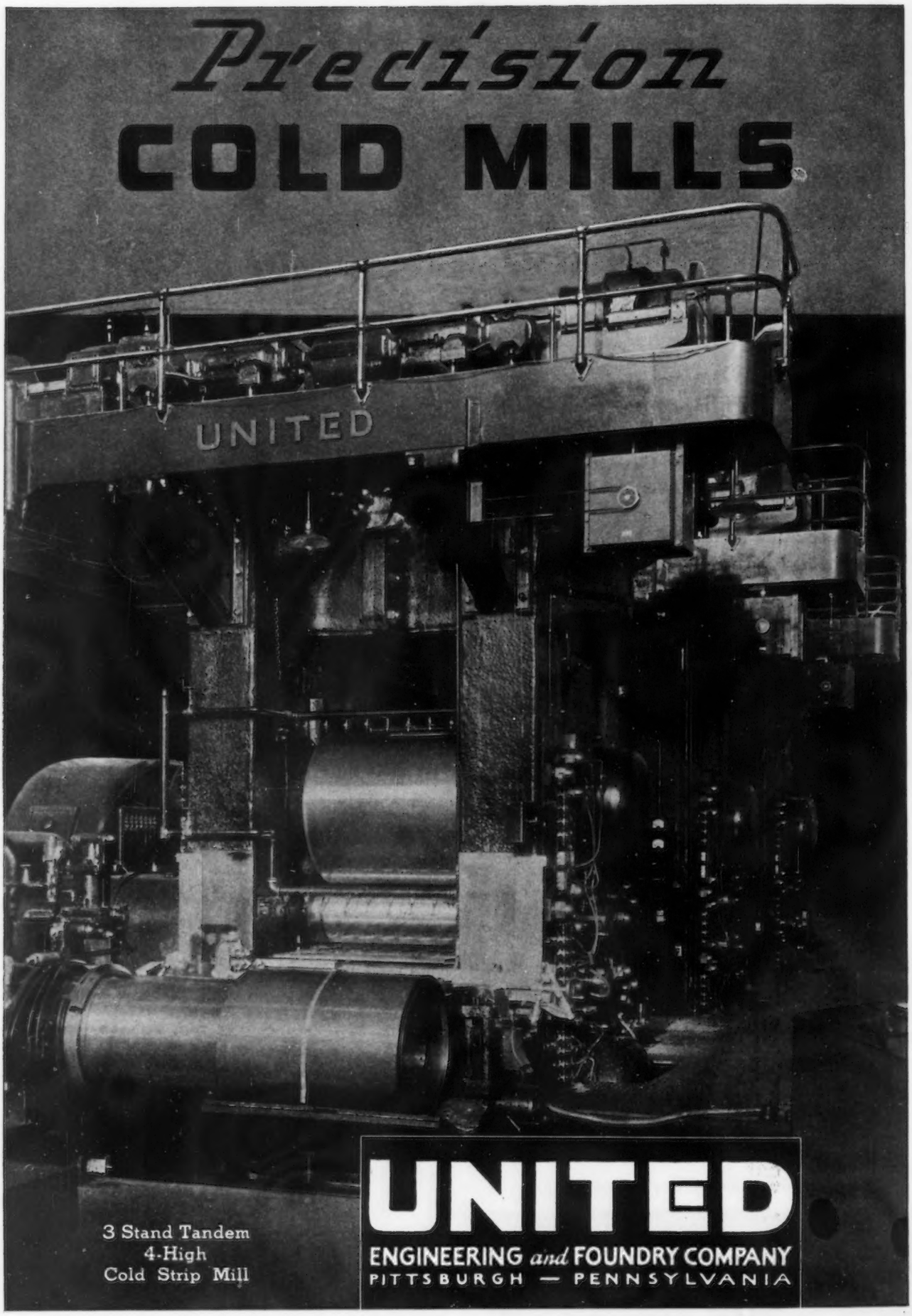
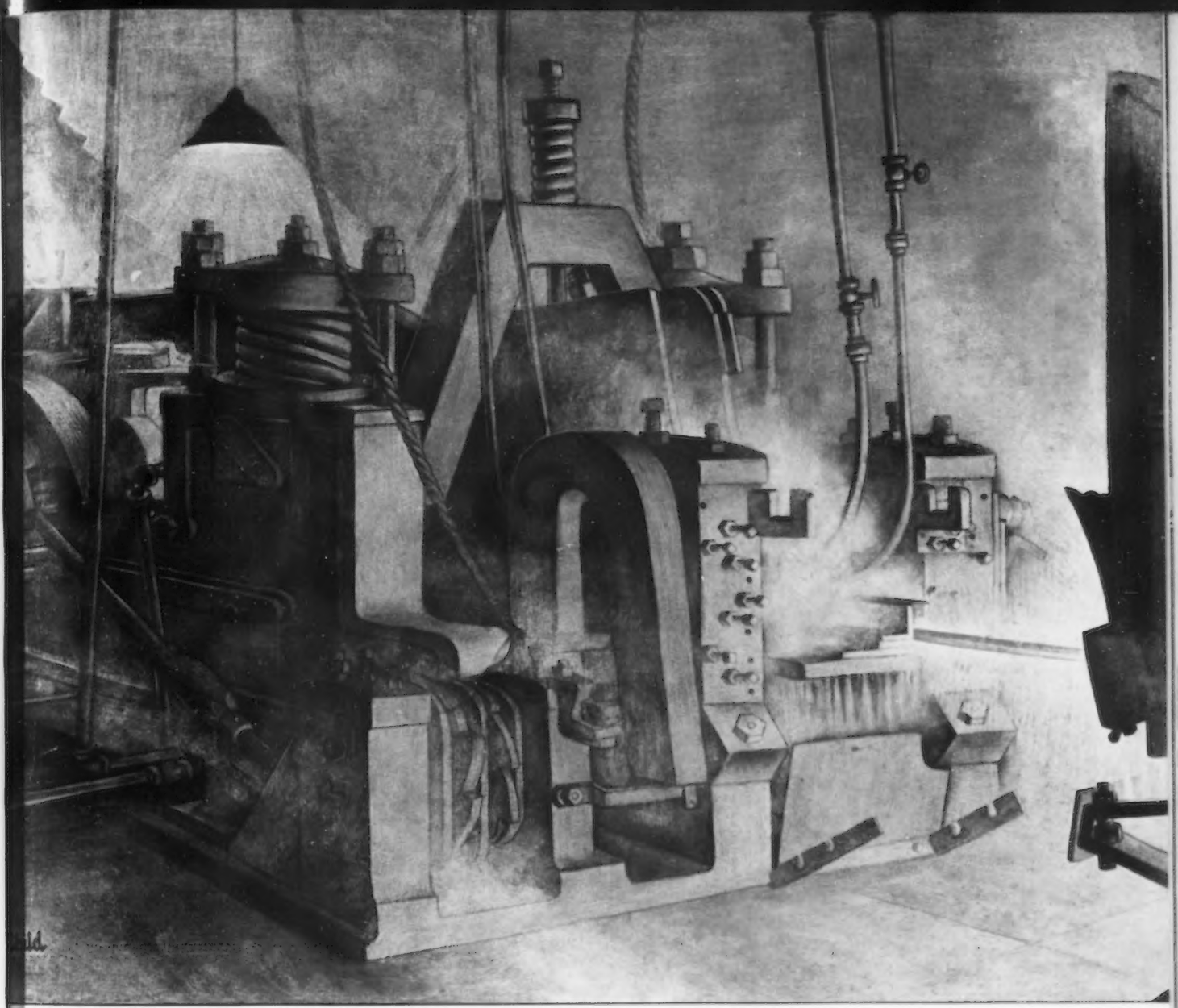
105 109 133 129 121

STEELS


Precision
COLD MILLS
UNITED
3 Stand Tandem
4-High
Cold Strip Mill
UNITED
ENGINEERING and FOUNDRY COMPANY
PITTSBURGH — PENNSYLVANIA



Machine for hot-forging track spikes in Bethlehem's Lebanon, Pa. Plant

Always seeking the best process

THROUGH the entire range of steel products manufactured by Bethlehem no stone is left unturned to give them properties making them definitely superior in their respective fields.

An excellent illustration of this policy is found in the manufacture of track spikes. These are among the simplest of finished steel products, ordinarily considered as calling for but little refinement in manufacture, but Bethlehem makes them by hot-forging —fundamentally the same process used to make vital parts of automobiles, locomotives and other machines where the highest degree of ruggedness is required.

This attention to small details affecting serviceability, handling or fabricating is characteristic of all Bethlehem products from bethanized wire, zinc-coated by a special electrical process, giving a vastly more durable coating, to controlled-cooled rails, processed in a way that eliminates transverse fissures.

BETHLEHEM STEEL COMPANY

Leading Products of Bethlehem

Bars and Special Sections
Carbon Steel Bars, Bessemer and Open Hearth in all grades and analyses; tube rounds for seamless piercing, special and automotive sections of every description. Iron Bars—chain, engine bolt and staybolt quality; muck bar. Rerolled rail steel.

Semi-Finished Steel
Carbon billets, blooms and slabs of rerolling and forging quality; sheet bars and skelp.

Fabrication and Erection of Buildings, Bridges and Other Steel Structures

Steel Plate Work and Construction
Tanks; towers; gas-plant equipment; oil-refinery and chemical-plant equipment. Barges and hulls.

Alloy Steels
Open-hearth and electric-furnace alloy steels for all purposes. Blooms and billets. Bars, hot-rolled, cold-drawn; black-as-rolled, centerless-ground, normalized, annealed or heat-treated. Special Sections. MAYARI nickel-chromium steels; MAYARI engine bolt and staybolt steels; Silico-manganese spring steel; SUPERTEMP, for superior physical properties at high temperatures.

Bolts and Nuts—Rivets—Spikes
Machine, Carriage, Lag and Specialty Bolts, Plain and Galvanized, Carbon and Alloy; DARDELET Self-Locking-Thread Bolts and Nuts; Hot-Forged, Cold-Punched and Semi-Finished Nuts; Iron and Steel Rivets, Fitting-up Bolts; Track Bolts, Drive Spikes, and Screw Spikes; Plain and Upset Rods, Turnbuckles, Boat and Wharf Spikes, Pipe and Tank Bands—Silo Rods.

Pig Iron
Basic, Bessemer, foundry, low phosphorous, malleable, malleable Bessemer; STANDARD MAYARI and SILVERY MAYARI alloy iron.

Ferro-Manganese

Forgings
Carbon and alloy; hammered and hydraulically pressed; drop and upsetter.

Castings
Carbon and alloy steel (open-hearth and electric), manganese steel, iron, brass and bronze, rough as cast or machined; abrasion-resisting castings. Centrifugal cast bronze sleeves and liners; ingot moulds.

Hydraulic Machinery

Wheels and Axles
Wrought-steel wheels and axles for freight and passenger cars and engine, tender and trailer trucks; for electric cars; for mine locomotives and mine cars; for cinder, ore and other industrial cars; crane wheels.

Rolled Steel Blanks
For gears, pinions and flywheels. Tire moulds and mould rings, shaft couplings, brake wheels and drums, pipe flanges, pistons and other circular forgings.

Tin Plate
Coke tin plate; black plate, galvanizing, enameling and lithographing stock. Bethcolite (cold-reduced tin plate).

Tool Steels
High-speed tool steels; carbon and alloy tool steels; cobalt magnet steel; hot-work tool steels; die steels; valve steels; rivet set and pneumatic chisel steels; special tool steels; nitralloy; tool steel billets of all grades. Rock and mine drill steels, hollow and solid.

Stainless Steels
BETHADUR and BETHALON, covering practically every requirement for stainless steels.

Tools
Rivet sets; punches and dies; chisel blanks and chisels; hot and cold friction saws; steel stamps (letters and figures for hot and cold work); slitting shears, shear blades; special high-speed tool holder bits; special tools.

Wire and Wire Products
Plain, bolt, screw, chain, extra-soft rivet and hard bright nail wire; bright processed, lime-bright and black-annealed, normalized, heading wire; bethanized telephone wire; galvanized wire; high-carbon and low-carbon wire rods; bethanized (special zinc-coated) wire, clothes-line wire; soft-processed wire; box stapling and binding wire; spring wire; barbed wire; Silver Star Bale Ties. Bethanized field and poultry fence. Bethanized lawn fence. Nails, staples.

Building Specialties
Bethlehem open-web steel joists; steel studs; metal lath.

Steel Fence Posts and Gates
Posts and gates for farm, garden, lawn and poultry fencing; snow fence posts; highway sign posts.

Structural Shapes
Bethlehem wide-flange beams and H-column sections; rolled joists and stanchions; standard beams, channels and angles; car and shipbuilding shapes.

Concrete Reinforcement Products
Steel reinforcing bars, spirals, and concrete accessories.

Steel for Highway Construction
Bar mats, expansion joints, contraction joints (road strip), steel highway guards.

Steel H-Piling

Steel Z-Piling

Steel Sheet Piling
Bethlehem steel sheet piling for temporary work, as in cofferdams; for permanent work, as in retaining walls, cut-off walls, and jetties.

Steel Plates
Universal and sheared plates, for all purposes; slabs.

Flanged Products
Tank heads, boiler heads, dome sheets, manheads, yokes, bolts and saddles; miscellaneous flanged plate work.

Trackwork for Steam, Electric, Mine and Industrial Railways
Frogs, switches, Bethlehem and NEW CENTURY SWITCH STANDS; crossings, steel ties, gage rods, rail braces, BETHCO rail anchors; silico-manganese and manganese special trackwork; hook-flange guard rails, compromise joints.

Steel Freight and Passenger Cars

Mine Cars

Railway Turntables

Rails and Accessories
Standard tee, girder, girder-guard and high-tee rails; light rails; splice bars, rail clips, tie plates. Controlled-cooled rails.

Steel Pipe
Butt-welded and lap-welded pipe, standard and line, black and galvanized; copper-bearing pipe. Welded steel pipe for water-distribution systems.

Boiler Tubes
Genuine old-fashioned knobbled charcoal-iron tubes; double-pass steel tubes. Double-pass copper-bearing steel tubes.

Steel Sheets
Hot-rolled, hot-rolled annealed, cold-rolled, heavy cold-rolled sheets; furniture, heavy furniture, automobile sheets; porcelain enameling sheets; tack plate; galvanized, flat and formed sheets; painted formed sheets; special-finish sheets. Sheets of BETH-CU-LOY (copper-bearing steel). BETH-CU-LOY Roofing.

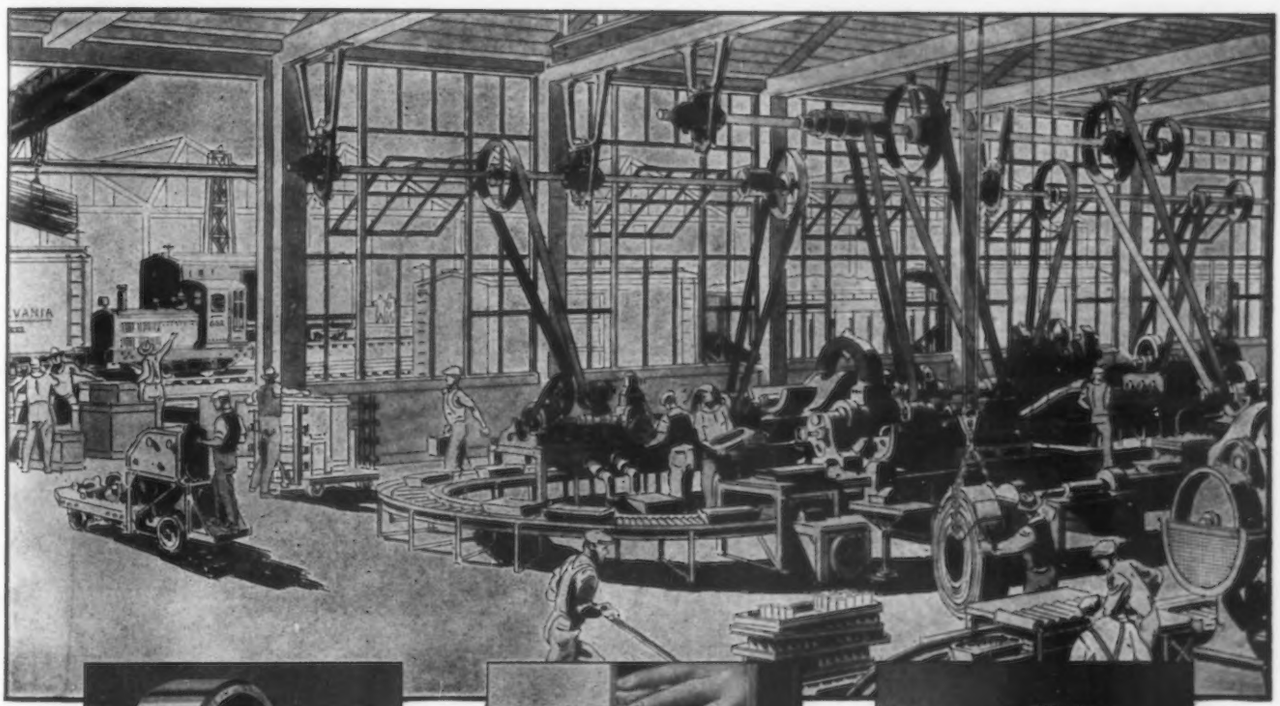
Steel Strip
Cold-rolled strip, hot-rolled strip, lamp stock, crown-fender stock.

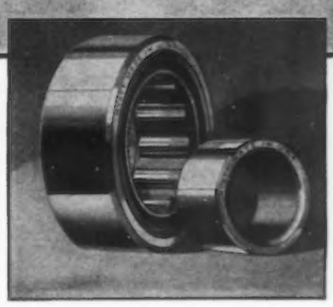
BETHLEHEM STEEL COMPANY, *General Offices*: Bethlehem, Pa. *District Offices*: Albany, Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Hartford, Honolulu, Houston, Indianapolis, Kansas City, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Portland, Ore., Salt Lake City, San Antonio, San Francisco, St. Louis, St. Paul, Seattle, Syracuse, Washington, Wilkes-Barre, York. *Export Distributor*: Bethlehem Steel Export Corporation, New York.

BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL

Where Service is *Most* Severe
HYATTS PREDOMINATE





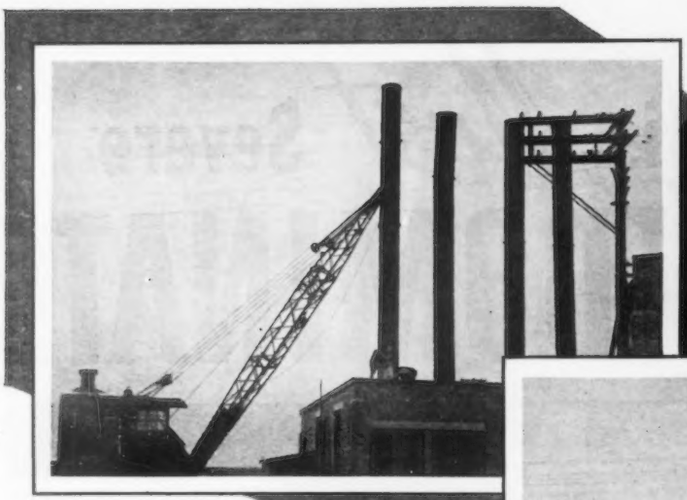
STOPS, starts . . . stresses, strains . . . call for dependable bearings. The millions of hours of carefree machine operation enjoyed every year are largely dependent upon the bearings that carry the load—and a large percentage of these bearings are Hyatt.

In all types of machinery and its complement of motors, line shafting, and material handling equipment, Hyatts serve and save, protect related parts, and take punishment without perceptible wear.

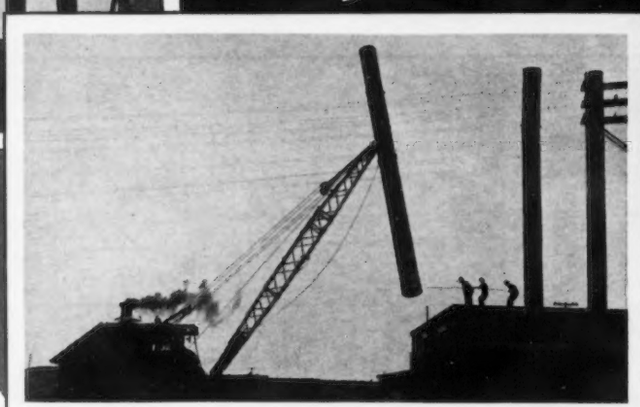
Small wonder, then, that equipment manufacturers continue to use more and more Hyatt Roller Bearings for the better design, better performance, and longer life of their products.

HYATT ROLLER BEARING COMPANY

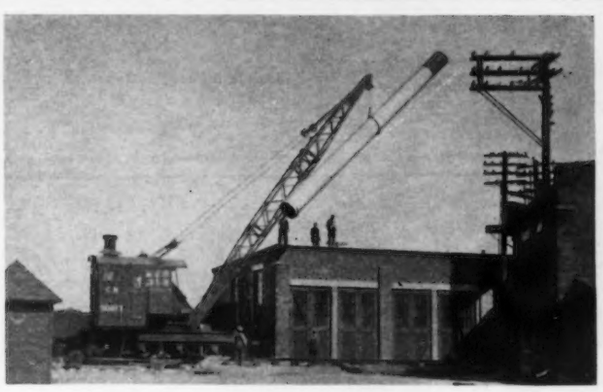
NEWARK DETROIT CHICAGO PITTSBURGH SAN FRANCISCO

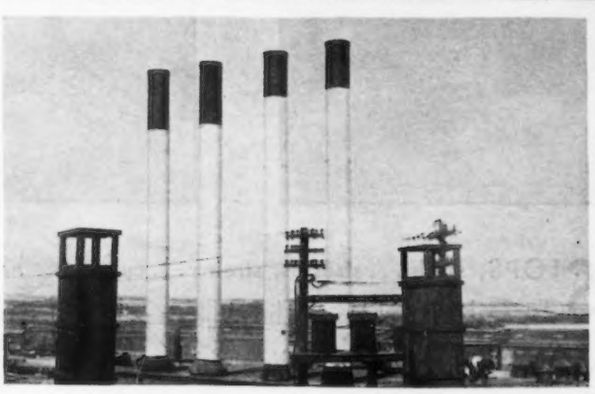


Just another day's work



The pictures tell the story of how the four old stacks, shown above, were taken down, removed from the roof of the building and replaced with four new ones This entire operation was completed in only ten hours, with an Industrial Brownhoist doing the handling





HOW do you handle the heavy lifts of one kind or another which come up nearly every day in your plant? How long, for example, would it have taken you to replace these four, fifty-foot stacks weighing four tons each? This Canadian shop, using its thirteen-year old Industrial Brownhoist, finished the work in ten hours.

Many executives believe that because they do not have enough steady work to keep a crane busy, it will not pay for itself. In some cases this is true but more often the regular work, plus these costly, occasional jobs, makes possible very substantial savings.

Why not let us match our knowledge of what a locomotive or crawler crane will do against your time to find out? If we can prove, beyond doubt, that an Industrial Brownhoist would be a good investment, it would be worth your while and ours.

INDUSTRIAL BROWNHOIST CORPORATION, BAY CITY, MICHIGAN
District Offices: New York, Philadelphia, Cleveland, Chicago

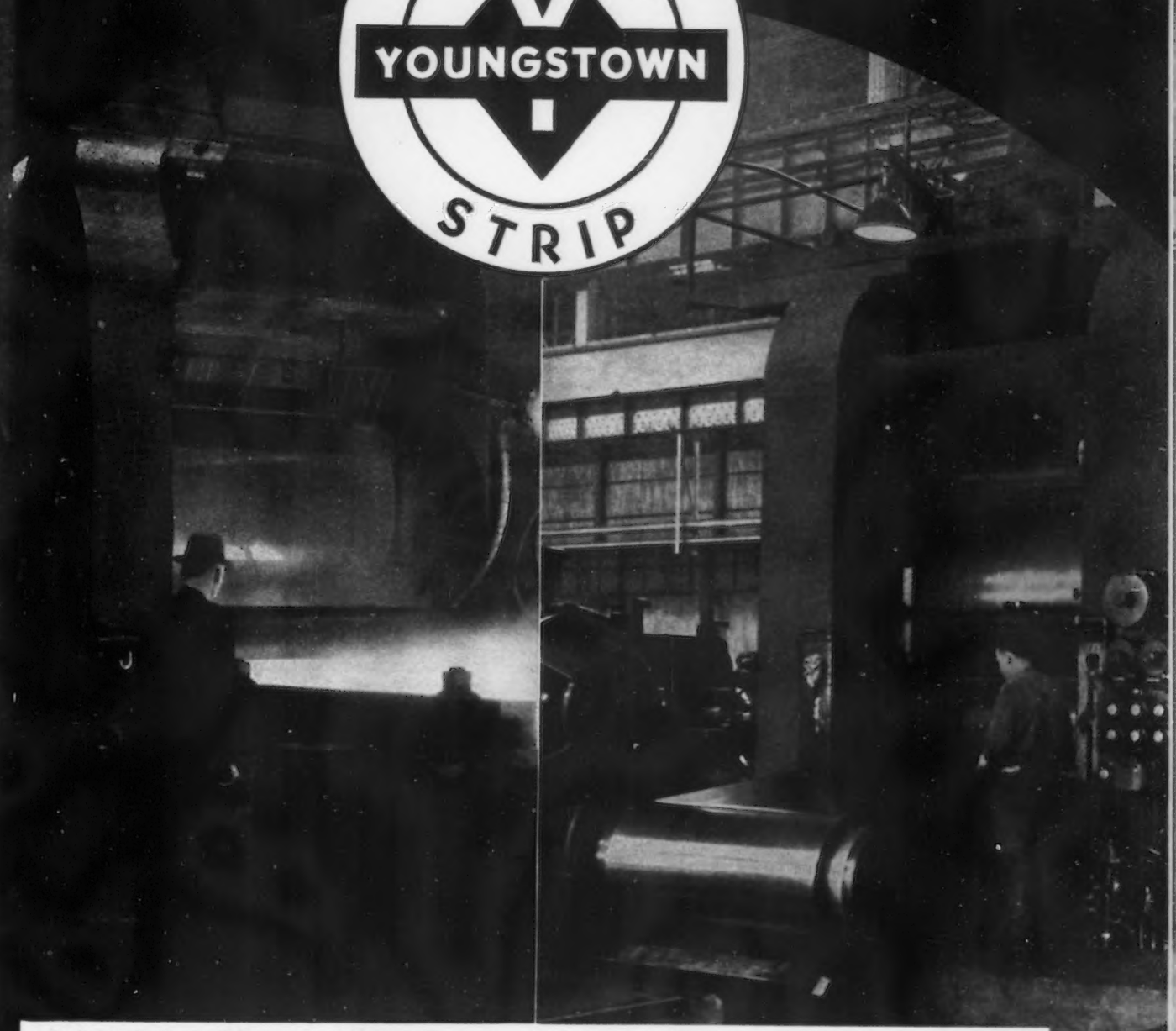
INDUSTRIAL BROWNHOIST

LOCOMOTIVE AND CRAWLER CRANES • 6 TO 200 TONS CAPACITY

HOT ROLLED COLD ROLLED SHEETS STRIP

TRADE MARK

YOUNGSTOWN



COMPLETELY MODERN PRODUCTION FACILITIES

HOT ROLLED

SHEETS

12 gauge to ½" inclusive

-	up to 72" wide
13-14 gauge	up to 66" wide
15-16 gauge	up to 60" wide
17-18 gauge	up to 48" wide
19 gauge	up to 36" wide

in either cut lengths or coils

STRIP

9" to 25 15/16" in coils: 4½" to 23 15/16" in cut lengths

The superior quality of Youngstown flat-rolled steel is constantly guarded by intensive metallurgical control and rigid inspection methods. Even these precautions, however, would prove insufficient if our production facilities and equipment were not completely modern and efficient. Men, methods and machines each play a vital part in attaining and maintaining the final result.

COLD ROLLED

SHEETS

28 gauge and heavier; widths 24 to 90 inches inclusive.
In either coils or cut lengths depending upon gauge and size.

STRIP

.015 and heavier; widths 9 to 23 1/8 inches inclusive.
In either coils or cut lengths.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

General Offices - - YOUNGSTOWN, OHIO

Tubular Products; Sheets; Plates; Tin Plate; Bars; Rods; Wire; Nails; Conduit; Unions; Tie Plates and Spikes

THE BEARING OF THE SPEED AGE!

THE great meteor streaking in fiery radiance across the skies sets the pace—and the world strives to keep up. New planes rocket through space. New cars fly along the highways. New trains flash across the rails. It is The Age of Speed . . . and speed takes heavy toll of bearings that are unfit!

Most any bearing will serve on a lumbering ox cart. But when it comes to Speed, engineers everywhere put their bearing problems squarely up to SKF. The finest of selected and specially processed steels go into SKF Bearings. The greatest of the world's anti-friction engineers are engaged in their designing. And only after the most vigorous laboratory tests does an SKF Bearing earn the right to its name.

Always make sure of the bearings in anything you buy, build or design. Specify SKF for all-around bearing performance.

SKF INDUSTRIES, INC., Front Street and Erie Avenue, Philadelphia, Pa.

Putting Go in Negotiation

THIS business of buying and selling steel products is not so simple as an over-the-counter transaction. Frequently, important problems involving men, materials, machinery and money must be answered before an understanding between buyer and seller is reached. The completeness of this understanding, and time saved in arriving at it, have a dollar-and-cents value to you. That is why all the men who make Weirton Steel decisions are at Weirton. With administrative, sales and operating heads all concentrated at one spot, negotiations are speeded up and satisfactory product performance made certain.

WEIRTON STEEL COMPANY, WEIRTON, WEST VIRGINIA

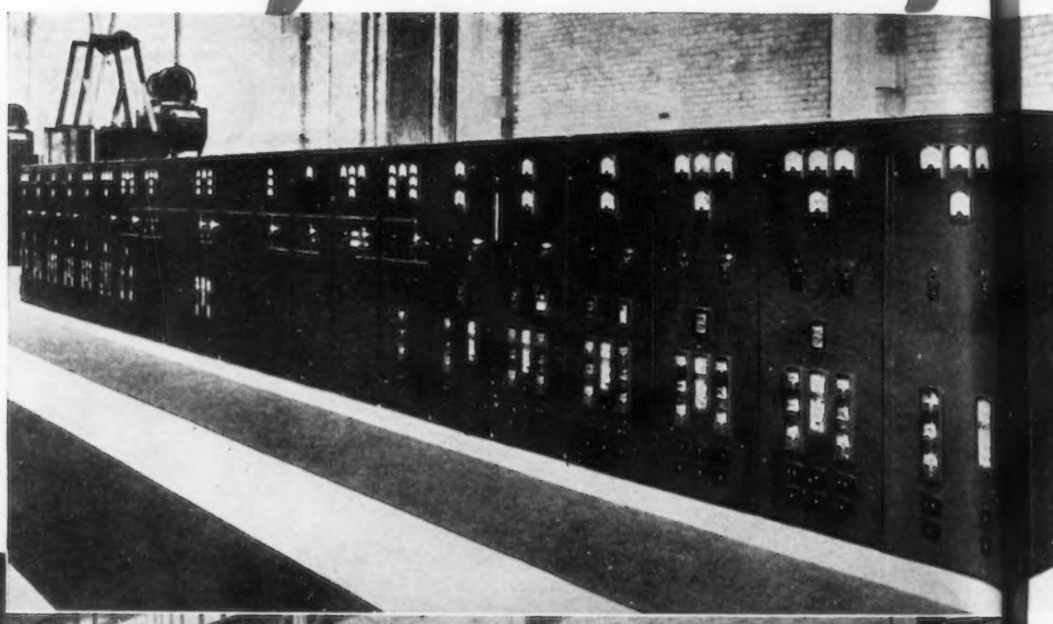
Division of National Steel Corporation

Weirton for Action

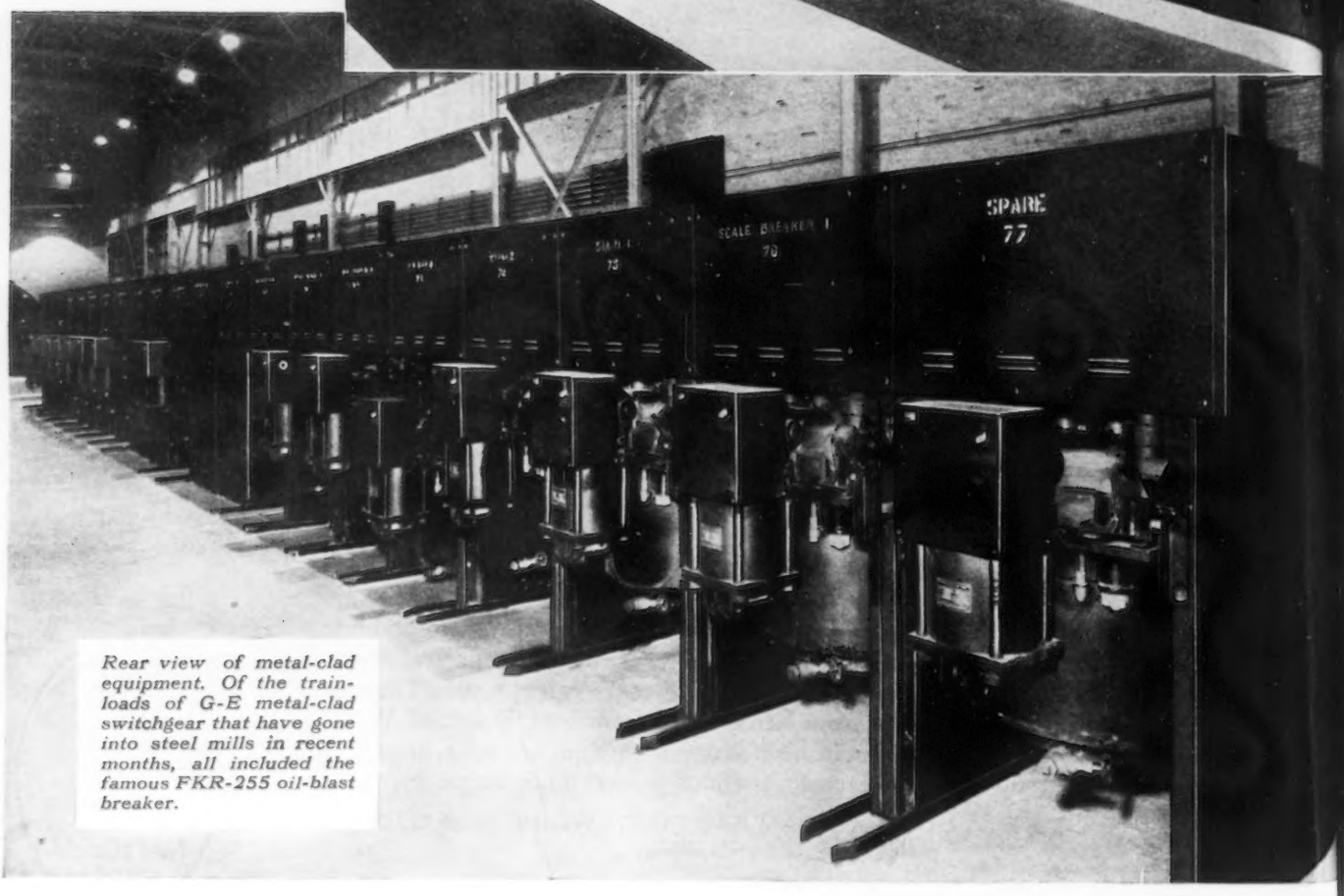
UNIT OF NATIONAL STEEL

WEIRTON STEEL

The Lengthening



Front view of the metal-clad equipment below, showing semiflush mounting of instruments and devices—practically the steel mills' standard



Rear view of metal-clad equipment. Of the train-loads of G-E metal-clad switchgear that have gone into steel mills in recent months, all included the famous FKR-255 oil-blast breaker.

G E N E R A L

Roll—

strip mill in Pittsburgh

1934 A hot-strip mill in Youngstown

1934 A cold-strip mill in Youngstown

1935 A blooming mill in Pittsburgh

1935 A hot-strip mill near Buffalo

1935 A cold-strip mill in upper Ohio Valley

1935 A hot-strip mill near Detroit

1935 A cold-strip mill near Baltimore

1936 A hot-strip mill in Pittsburgh

1936 A cold-strip mill in Pittsburgh

1936 A rod mill near Chicago

1936 A semicontinuous plate mill near Pittsburgh

1936 *The Latest Job — 48 units for a large power house in the Monongahela Valley*

All 500,000-kva General Electric metal-clad switchgear. Shipped assembled — received complete, ready to operate

RENEWED and conclusive evidence that General Electric metal-clad switchgear is the accepted mill standard

G.E. BUILDS WITH STEEL

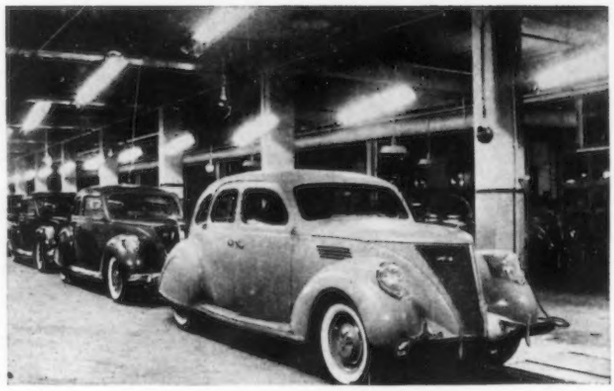
880-13

ELECTRIC

COOPER-HEWITT ENGINEERED LIGHTING

Banish shadows . . . increase production with this long light source

Eyes are able to focus quickly . . . pupils do not have to expand and contract constantly . . . when the illumination overhead is Cooper-Hewitt Mercury Light. The cool, restful rays from the long light source get down inside even the most complex working mechanisms. Workers never have "too much" light in one place and "not enough" in another. The low intrinsic brightness of the light itself is glareless —which means less eye-strain to the worker and uniformly better work produced.



Where perception of detail is the most important factor, the restful yellow-green rays of Cooper-Hewitt light alone is the finest illumination obtainable. For operations that require perception of color, incandescent lamps can be added to the mercury. The resulting illumination is a very close approximation to daylight.

General Electric Vapor Lamp Company engineers will recommend the proper light for every job—based on over 30 years' experience in engineered lighting . . . General Electric Vapor Lamp Co., 833 Adams Street, Hoboken, New Jersey.

STANDARD MERCURY

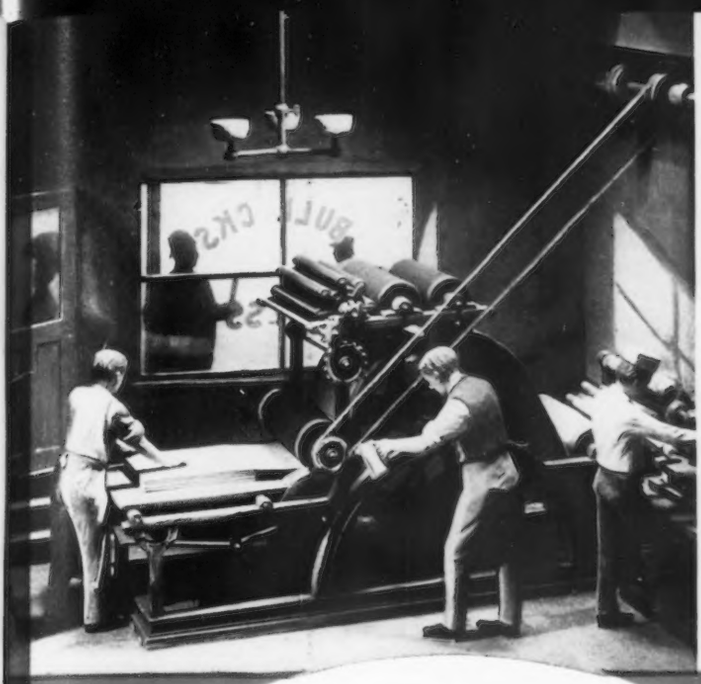
The Cooper-Hewitt Mercury Light has been the standard of industrial illumination for over thirty years.

COMBINATION MERCURY AND INCANDESCENT

For use where discrimination of color is of paramount importance.

GENERAL ELECTRIC VAPOR LAMP COMPANY

750C



HERE'S WHERE WE LEARNED OUR TRADE!

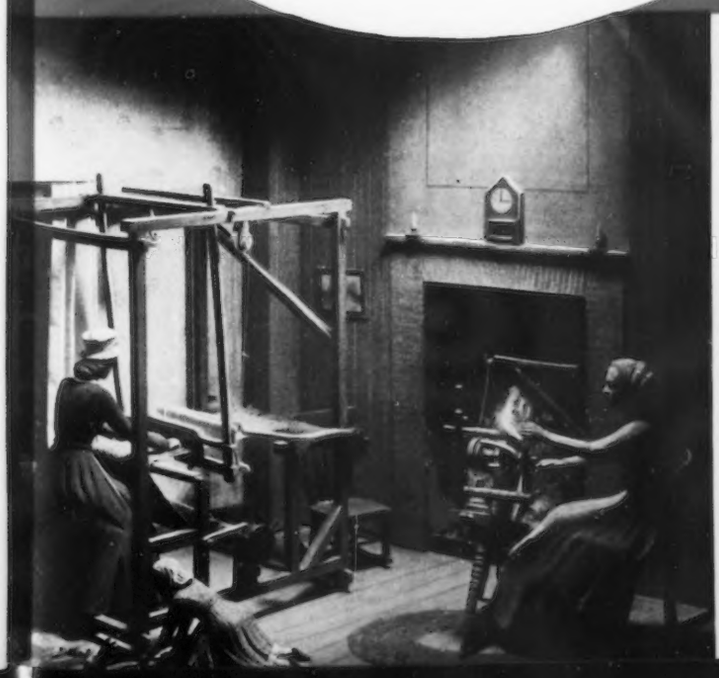
Thousands of Plants Agree Socony-Vacuum Places at their Disposal the Greatest Experience in the Oil Industry

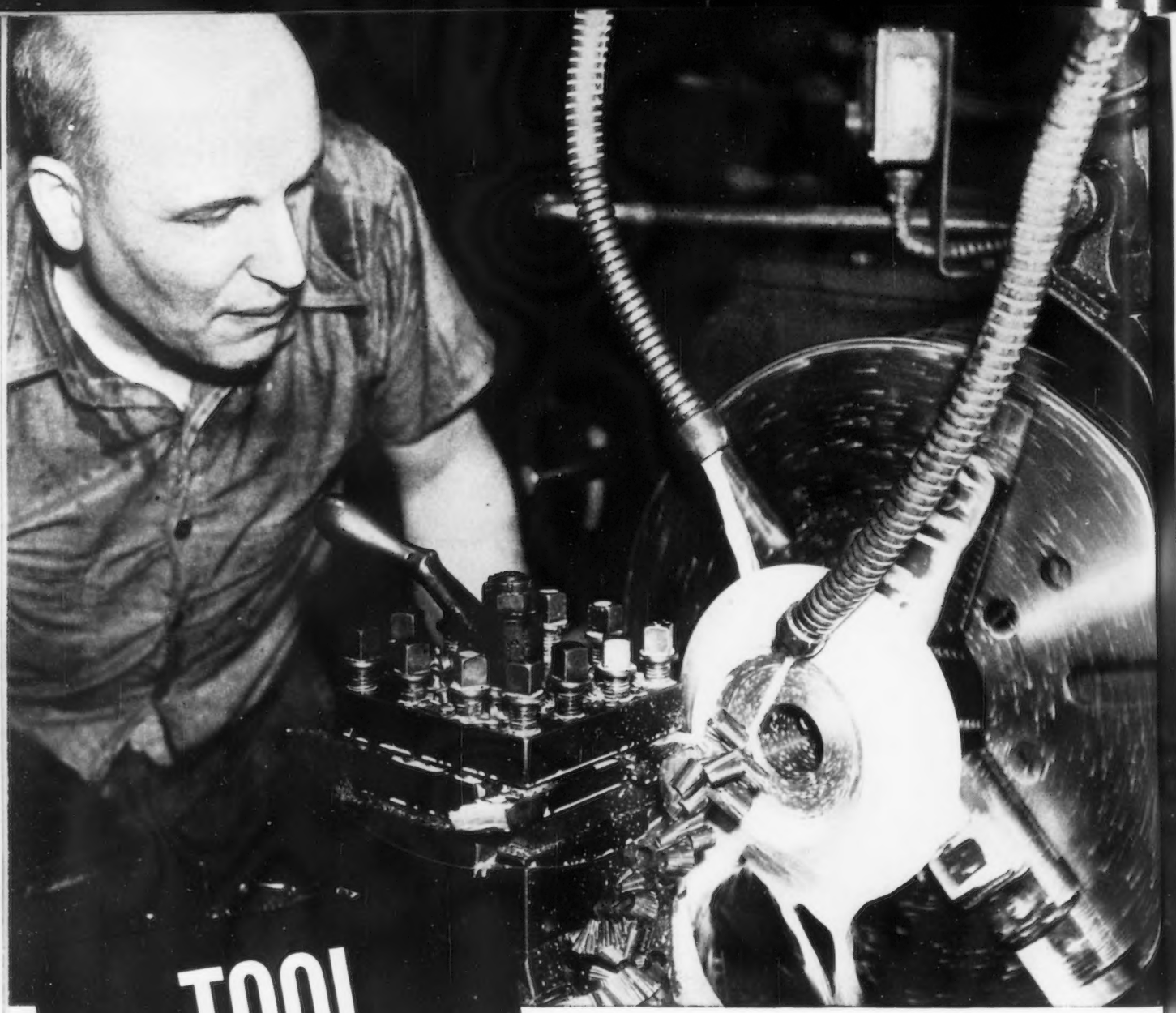
● THE MAKERS OF Gargoyle Lubricants were in at the beginning . . . working side by side with many early prophets of present day industry . . . providing the right kind of oils.

Since 1866 Gargoyle Lubricants have been accepted as the standard of excellence. Today, with 70 years of experience back of them, they are helping American Industry modernize itself.

This exclusive experience enables men and machines to step up plant efficiency . . . increase operating profits.

PROFIT BY READING THE NEXT PAGE





TOOL GRINDS GIVE PROOF!

Cutting Oils, Coolants backed by Soco Vacuum Experience give better Resu

THE AMOUNT OF WORK per tool grind has always bee pretty accurate index for cutting oils and coolants. I by this standard that thousands of metal workers are sw ing over to Socony-Vacuum Products. By comparison w other oils, it is found that these products speed up product They safeguard expensive equipment. No matter what t of metal you are using, regardless of operating characteris Socony-Vacuum Cutting Oils and Coolants help to improv quality and quantity of work done and lower production c

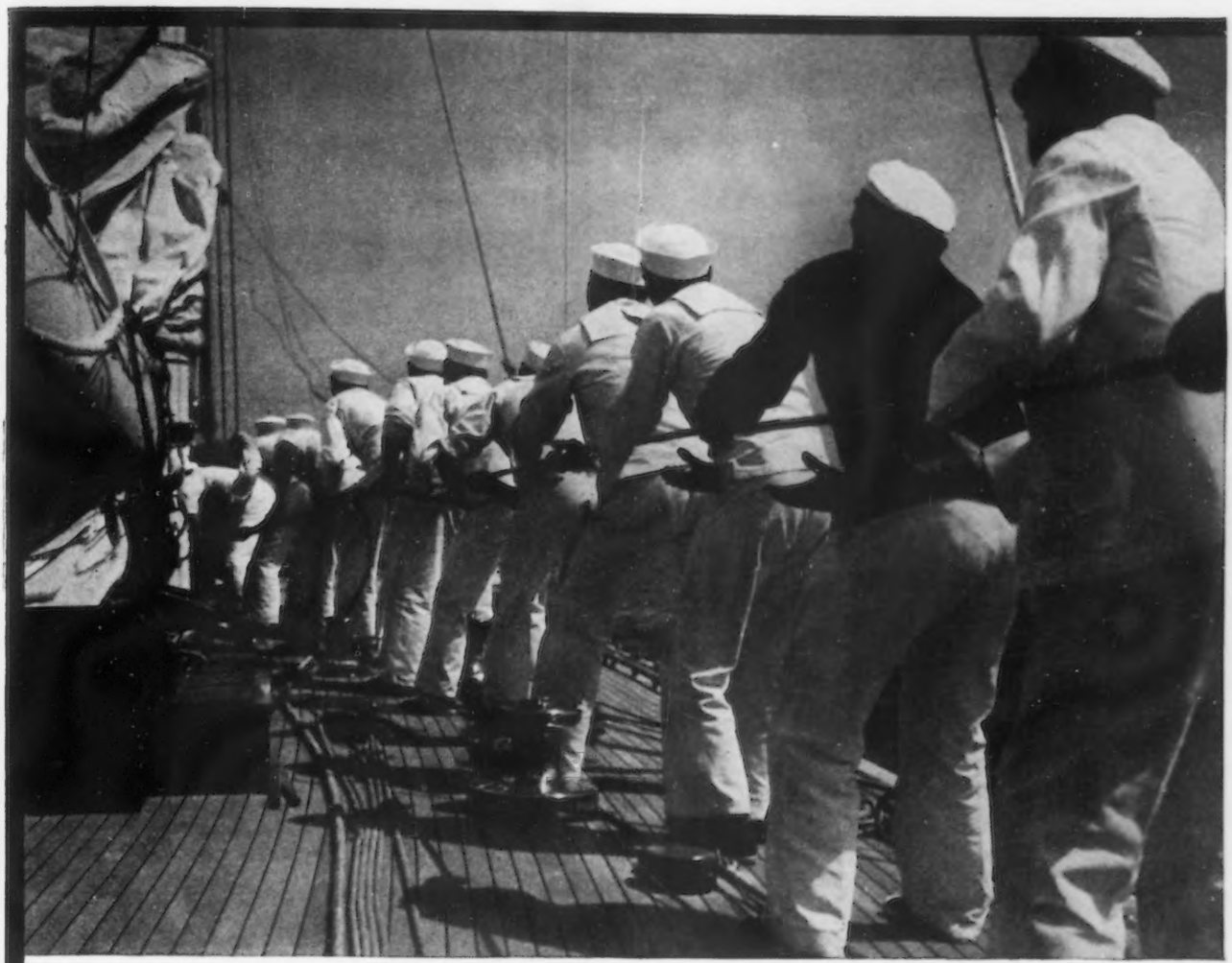
WHEN you talk with the Socony-Vacuum Representative, ask him to "get down to Brass Tacks"... show your men how to benefit by our practical experience.

GARGOYLE

Lubricants

SOCONY-VACUUM OIL CO.
INCORPORATED

STANDARD OIL OF NEW YORK DIVISION · WHITE STAR DIVISION · LUBRITE DIVISION · WHITE EAGLE DIVISION
WADHAMS OIL COMPANY · MAGNOLIA PETROLEUM COMPANY · GENERAL PETROLEUM CORPORATION OF CALIFORNIA



COORDINATION

● Yo-heave-ho! Perfect coordination of all hands on deck, the mainsail goes up, and we're off in a spanking breeze! . . . In steel making, it's the coordination of metallurgical factors during the melting of a heat that gives the steel a perfect start. Important among these metallurgical factors are the right ferro-alloys and their addition to the heat in correct amounts under the most suitable operating conditions.

Since 1906 Electromet has made the *right* ferro-alloys. Electromet Metallurgists, with years of practical experience in steelmaking, can help you use them properly to make better steel. This assistance is part of Electromet Service which is available without obligation.

ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation

UCC

Carbide and Carbon Bldg., 30 E. 42nd St., New York, N. Y.

Electromet
Ferro-Alloys & Metals

COM

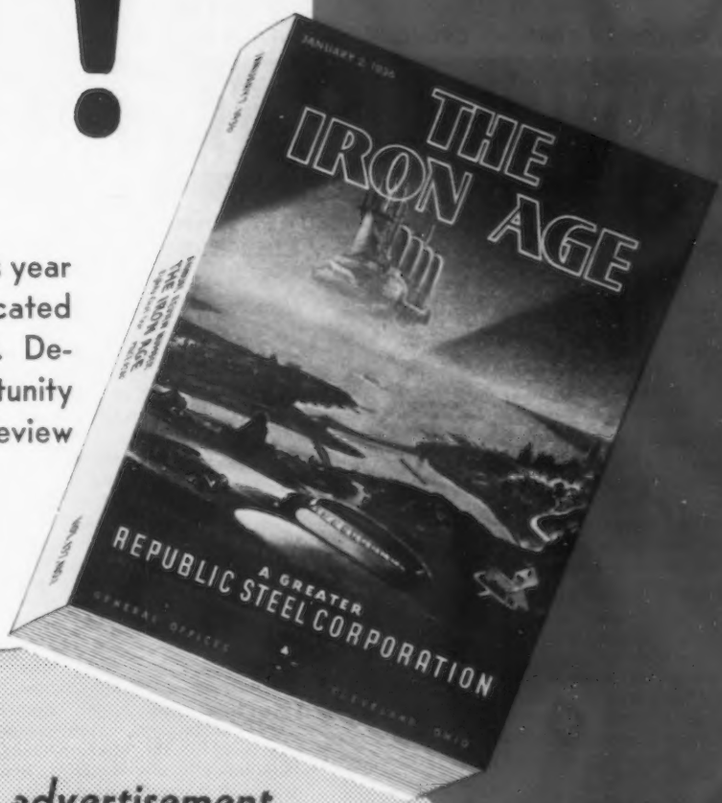
The IRON AGE Annual Review Number is Coming!

January 7th, 1937, is the date. Executives in the Metal Working Industry, from foremen to presidents, depend on THE IRON AGE Annual Review Number to give them a thorough picture of what has happened during the past year. This is the annual opportunity for alert advertisers to present all their products to the very people who will influence purchases during 1937.

ACTION NOW MEANS

NG!

Send your reservation now. This year your advertisement can be located to bring you maximum benefit. Develop to the full the opportunity presented by The Annual Review Number.



Your advertisement can be placed in sections dealing with these subjects:

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MACHINE TOOLS
SMALL TOOLS AND GAGES
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PRESSES AND SHEET METAL MACHINERY
POWER TRANSMISSION
MATERIALS HANDLING
STEEL MILL EQUIPMENT
HEAT TREATING
FURNACES AND REFRACTORIES
WELDING AND FABRICATING PARTS
METAL CLEANING AND FINISHING
PLANT EQUIPMENT
FOUNDRY EQUIPMENT AND SUPPLIES

S PROFITS LATER

A REVIEW OF CURRENT CATALOGS & CIRCULARS — A TIME SAVING SERVICE FOR BUYERS

INDUSTRIAL LITERATURE DIGEST

ORDER BY NUMBER LITERATURE WANTED — WILL SEND YOU AS MANY AS REQUESTED NO COST, NO OBLIGATION . . ADDRESS THE IRON AGE, 239 WEST 39TH ST., NEW YORK CITY

Lubricators. — Madison-Kipp Corp. Folder, 26 pages, devoted largely to various models and types of lubricators for a variety of service. Several models of the company's die casting machines are also illustrated. *Bulletin 11-20.*

Hardening Furnaces. — American Gas Furnace Co. Bulletins describing improved furnaces and ovens for hardening high-speed steel. They have high heating speed, atmosphere and combustion control and are of the new oven-fired bottom-vented type. *Bulletin 11-21.*

Heat Transfer.—Dow Chemical Co. An illustrated catalog, replete with tables, showing systems of efficient transfer of high temperature heat. The new Dowtherms have liquid properties such that they may be used far below 450 deg. F. in systems where water and steam may be objectionable because of possible scale forming and pressure problems. *Bulletin 11-22.*

Copper Alloys.—Chase Brass & Copper Co. An illustrated and informative booklet on wrought copper alloys. Tabular matter shows not only the more important physical and mechanical properties but also much about the working, welding and machining of all the commercially important alloys. *Bulletin 11-23.*

Forging Furnaces.—W. S. Rockwell Co. Catalog No. 361 illustrating many different types of industrial installations of forgings and heating furnaces. *Bulletin 11-24.*

Aluminum Finishes. — Aluminum Co. of America. An illustrated and highly practical book prepared to assist users of aluminum in solving their finishing problems. Describes mechanical finishes, chemical dip coatings, electrolytic oxide, paint and lacquer finishes and electroplating on aluminum. *Bulletin 11-25.*

Resistance Wire.—C. O. Jelliff Mfg Corp. The first Kanthal catalog which describes all the types and properties of this new resistance wire which operates at much higher temperatures than ordinary nickel-chromium wires. *Bulletin 11-26.*

Industrial Controls. — Automatic Temperature Control Co., Inc. Bulletins describing and illustrating time controls, motor-operated controllers, etc., and listing catalogs and literature. *Bulletin 11-27.*

Contractors' Equipment. — Worthington Pump & Machinery Corp. 24-page bulletin showing power, compressed air, drilling, pumping and miscellaneous equipment on the job and in shop. Profusely illustrated. *Bulletin 11-28.*

Chains. — American Chain Co., Inc. Catalog 365 covers welded chain and attachments from lighter sizes and types used for fabricating other manufactured articles to the heavier types used for maintenance service and material handling in industrial plants, oil fields, mines, shipyards and on boats. Catalog 366 covers weldless chains and attachments. *Bulletin 11-29.*

Industrial Trucks. — Lewis-Shepard Co. Illustrated folder picturing floor trucks for factory, warehouse and industrial use for the interior transportation of practically any material, merchandise or product manufactured or handled. *Bulletin 11-30.*

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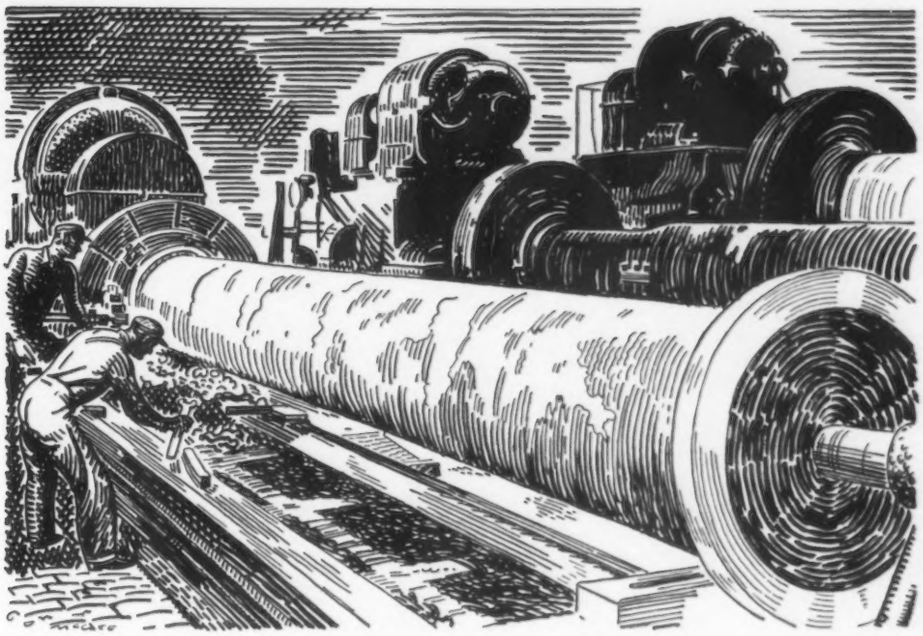

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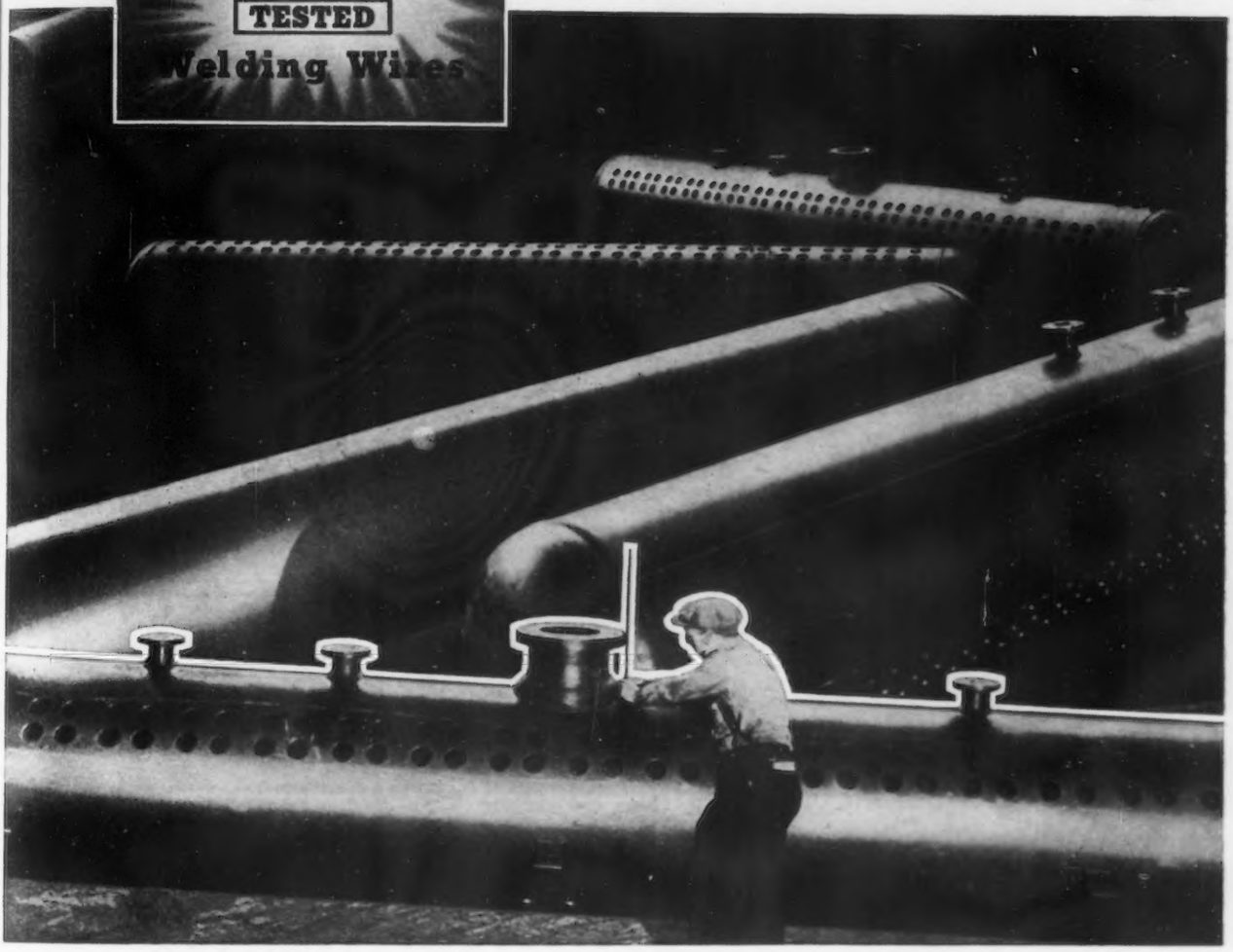

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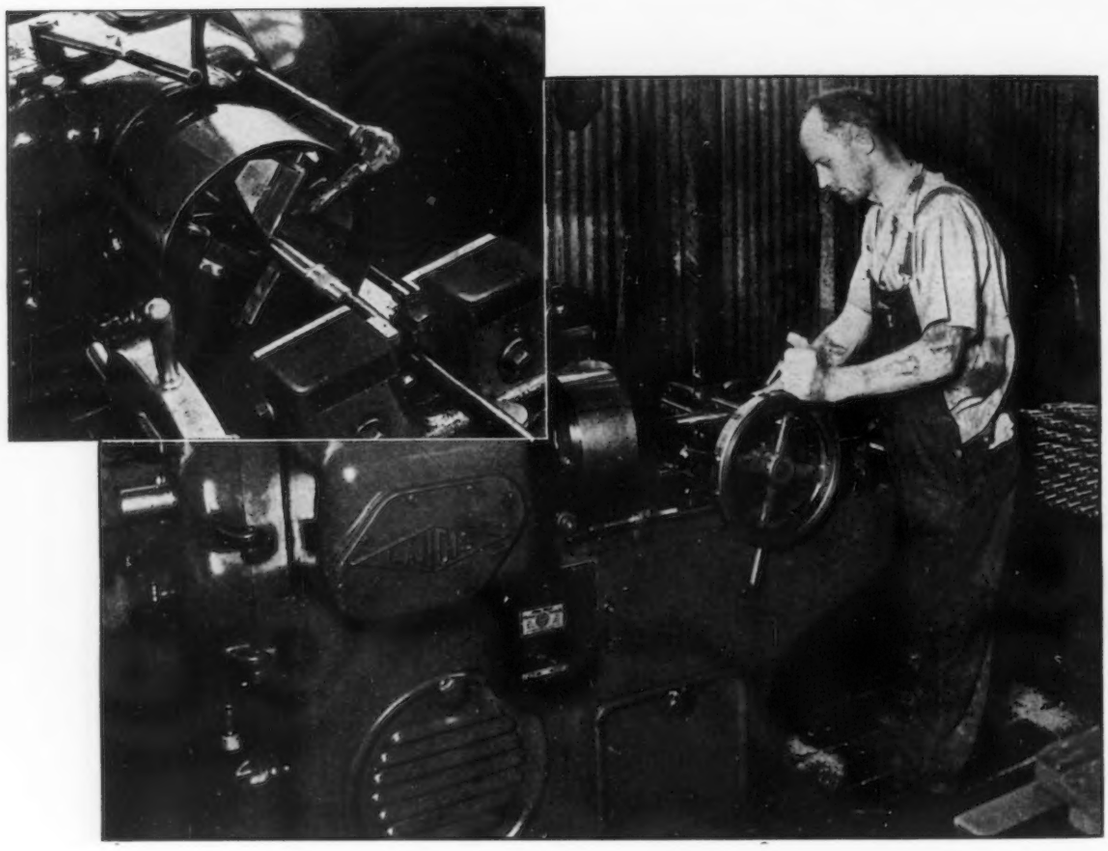

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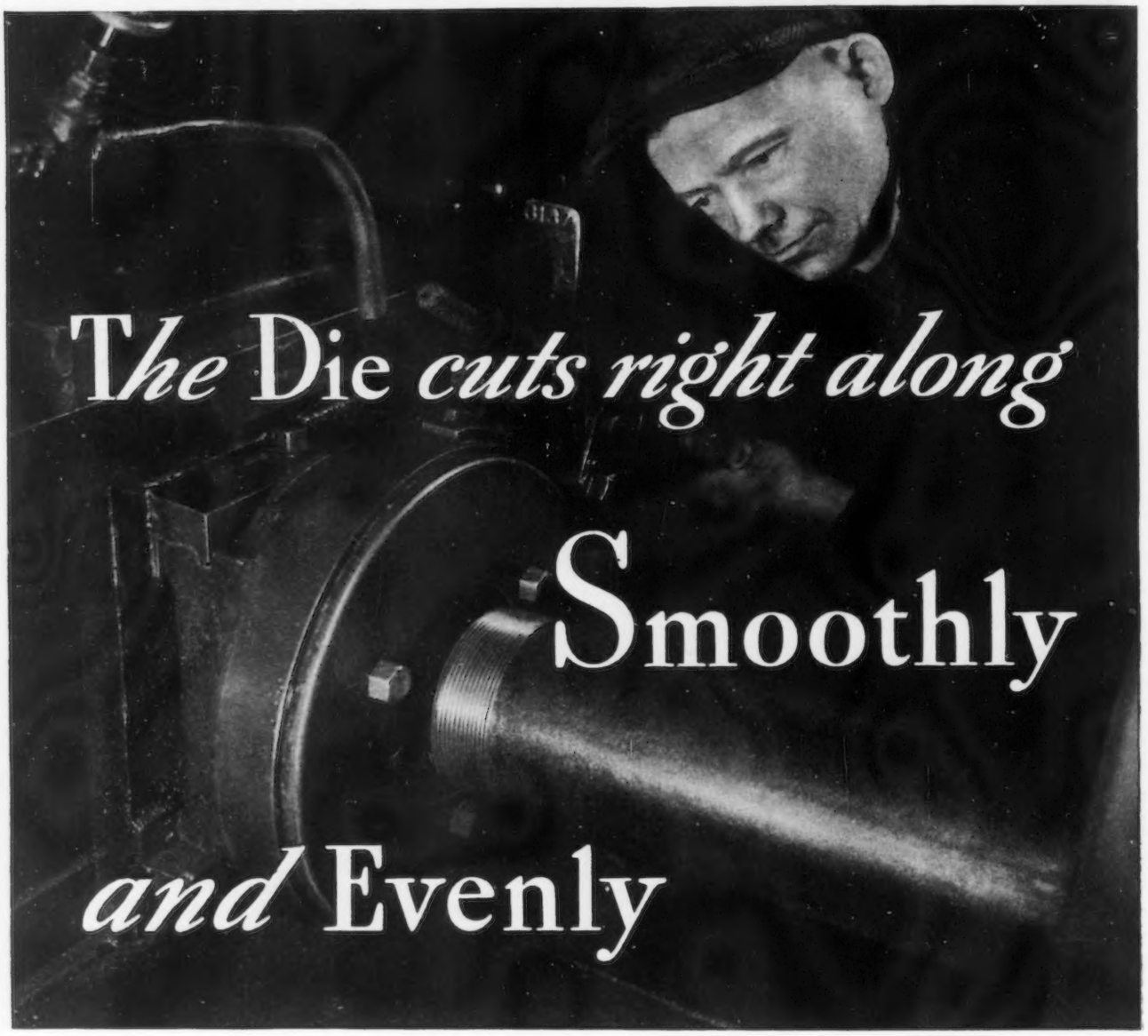

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...THE IRON AGE...

ESTABLISHED 1855 NOVEMBER 5, 1936 Vol. 138, No. 19

An Untimely Editorial

USUALLY The Iron Age is able from week to week to comment with timeliness upon the course of current events. Once every four years, however, we are placed under a handicap. Election day comes invariably upon a Tuesday. Having therefore to "go to press" on Monday, a day earlier than usual, we do not know, at this writing, who will be the next President. Of course, we have our convictions as to the probable outcome and these, as is usually the case, coincide with our hopes.

Approaching you, therefore, in the spirit of ambiguity, here are our comments upon the election.

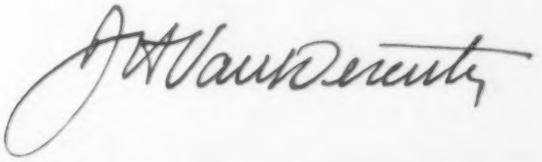
America has spoken in no uncertain terms. The new President is the choice of the people. Majority opinion rules in this country and will continue to rule as long as we remain a democracy.

America has spoken. The people have gotten what they asked for through their ballots and they deserve what they will get.

This election has proved, or if it hasn't, the next one will, the truth of the time worn saying: "You can fool some people all the time and all the people some of the time, but you cannot fool all the people all the time."

After you have pondered sufficiently upon these ambiguous profundities, consider for a moment the business outlook under the new administration. It is our firm conviction that business will continue to improve. If this administration wasn't able to stop the improvement, we do not think that we need to worry much about the next one.

So, let all of us—and this includes The Iron Age of course—forget politics for a while and buckle down to business.



Reliance Placed on Well Steel Castings for the

THERE is no news in the statement that steel castings have long been used in the building of ships; whether they be merchant vessels, submarines, destroyers, cruisers, or battleships. Probably this is known to most persons who produce or consume the industrial metals. Perhaps a good many people who have no connection with the heavy industries would hazard a guess—if required to state their opinion—that anchors customarily are produced in the steel foundry. Of course those who in one way or another help to build ships know that most such parts as sternposts and rudder frames have been made of cast steel for many years.

At the 1931 meeting of the Society of Naval Architects and Marine Engineers, Rear Admiral George H. Rock (then Chief Constructor of the U. S. Navy) presented a paper that was of great interest to the supplier as well as the user of naval equipment. This officer, in analyzing the performance of many classes of material used on ships, discussed steel castings at considerable length.

Rear Admiral Rock's paper contained the following significant statements:

"The art of manufacture of steel castings has progressed enormously in recent years, and ship designers have taken advantage of the possibilities offered by their use. Because of their greater strength, marked economies of weight and cost are possible where they can be used in place of composition castings. * * * Economies in cost are also possible where they can be

Designed, Properly Made Good Ship "Queen Mary"

By R. A. BULL
Consultant on Steel Castings

° ° °

used in place of forgings. While the use of steel castings in ship construction has been greatly increased, unfortunately this use has not been attended with entire success, and in many cases serious embarrassment has been caused by difficulties and delays in securing satisfactory castings and the failure of defective castings actually installed.

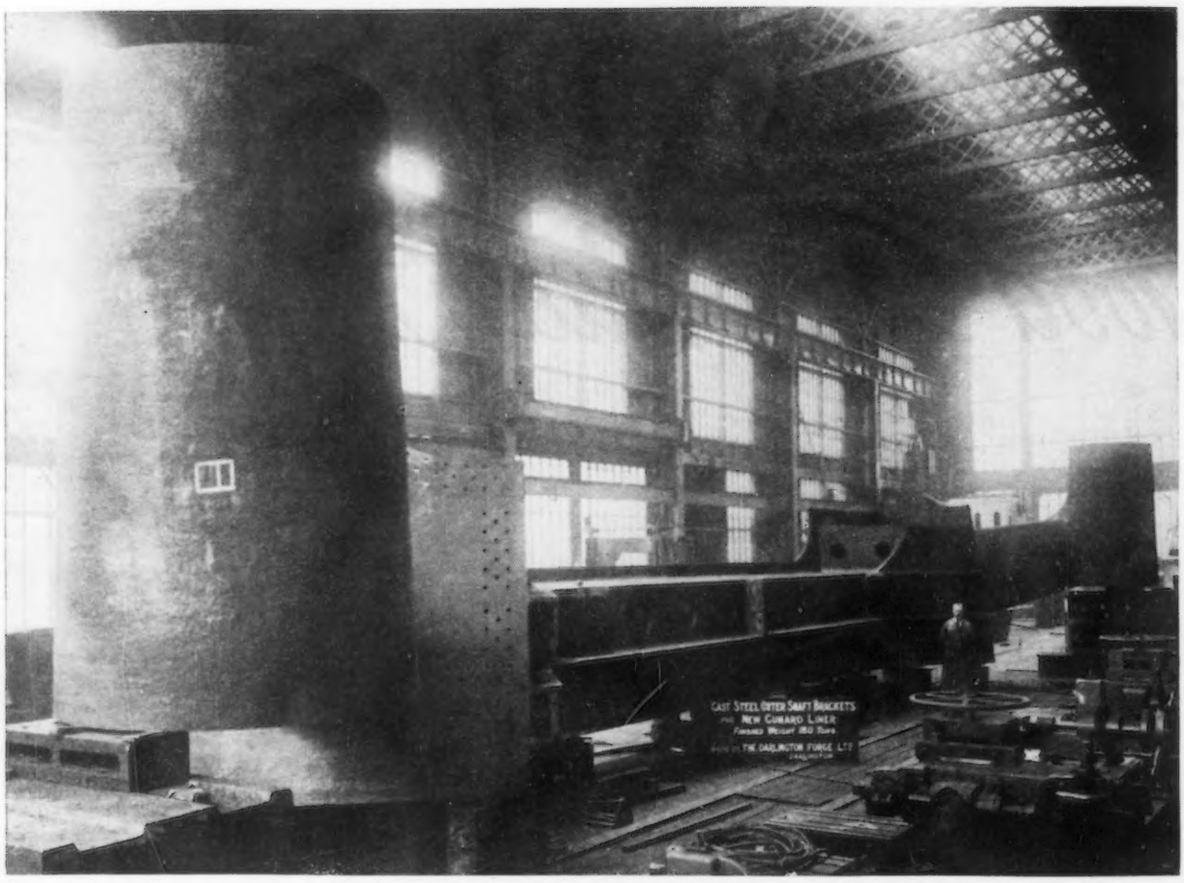
"A study of the conditions leading to these failures appears to be in order, so that steps leading to remedying the difficulty may be suggested. * * * *At times it has appeared that the requirements of the designer were such* that *satisfactory steel castings could not be produced by the foundries. However, in each such case careful study of the problem and the adoption of special measures by the pattern maker and the molder have proved the possibility of making satisfactory castings to meet the requirements.* * * * It seems axiomatic that there must be close cooperation and continual consultation between the pattern maker and the foundryman. Indeed, a further step is definitely indicated, that the *designer also must consult freely with the foundryman in designing the castings. Many features of design, form of castings, etc., which lead to difficulties of molding and defects in the castings, might readily be changed by the designer if informed of the circumstances.*" (The present writer, not the author of the paper from which the sentences are quoted above, is responsible for the *underscoring.*)

In 1933 an issue of the *Journal of the American Society of Naval Engineers* contained an article written by Captain Louis Shane of the U. S. Navy. This paper described the impressions made on the author's mind as the result of visiting 38 steel foundries in 10 European countries. The purpose of this trip, made by instructions from the Navy Department, primarily was to determine whether better results were obtained in steel foundry practice over-seas than in the United States; and why foreign practice was superior to ours, if the latter were found to suffer by comparison.

Captain Shane, an officer of long experience in our Navy, was not a foundryman. For the purpose of his visit he was of course considerably handicapped by that circumstance. It is quite possible that Captain Shane was shown those details of steel casting practice abroad which the average host is apt to exhibit to the visitor on whom he wants to make a good impression. Human nature being what it is, we cannot consistently criticise our foreign colleagues for possibly doing as we may have done under comparable circumstances.

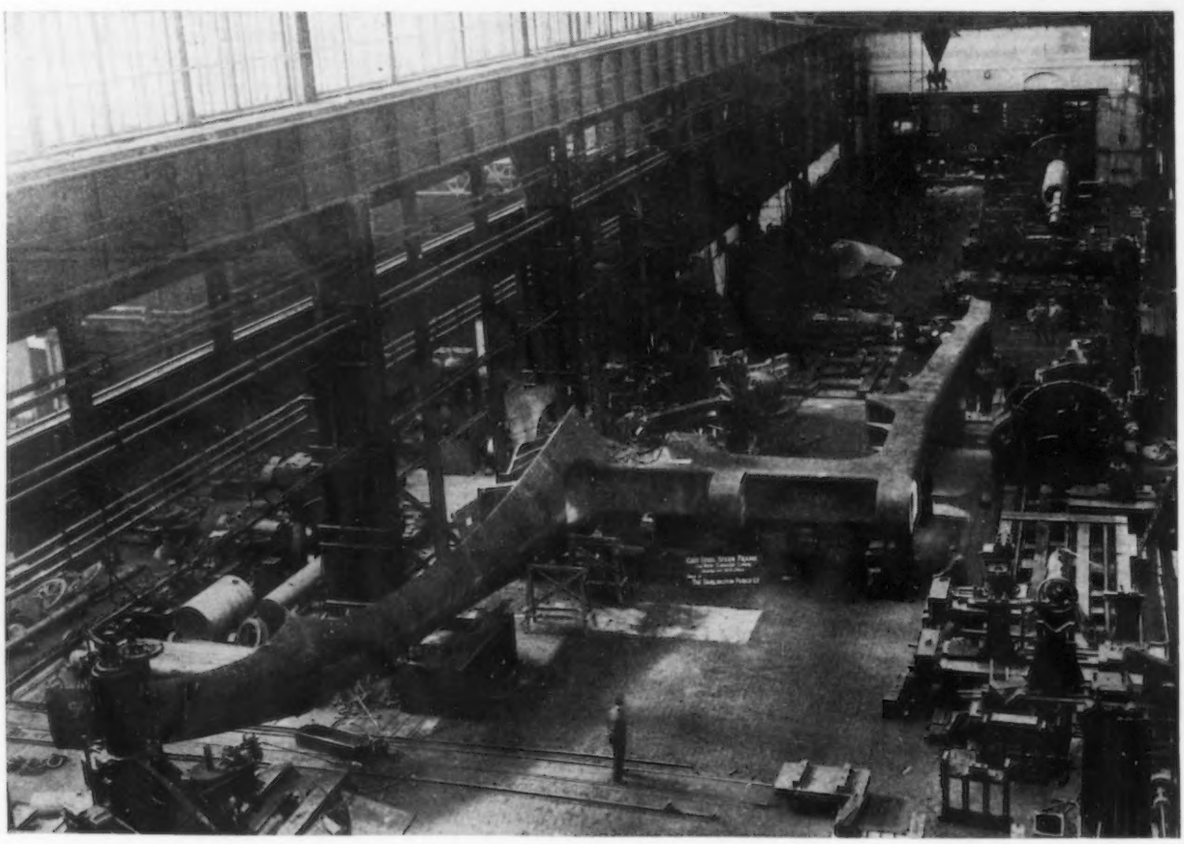
Captain Shane's published report made after his return from Europe resulted in a great deal of comment among steel foundrymen in America; primarily because it indicated the officer's honest belief that the practice in making steel castings in Europe was somewhat superior to that followed in the United States. One may—and many foundrymen in this country did—refuse to accept the conclusion, without questioning the sincerity of the observer or the competence of the naval officer in his own field.

The writer has not been prompted to prepare the present article because of any claimed merits or deficiencies of the technique and equipment employed for making steel castings in any country. Nor is it now the purpose to revive spirited technical arguments on the subject, which broke out several years ago (incidentally involving the present writer). As a matter of fact, the great extent of the existing international interchange of information regarding steel casting manufacture makes it rather improbable that any substantial differences in quality now prevail between the results of American practice and those of European practice; provided that comparisons are made on steel castings for comparable purposes, produced in the more progressive establishments in each country. There has been followed for many years the procedure of holding international foundry congresses periodically in the United States and Europe, also the related custom whereby the Institute of British Foundrymen and several technical organizations of casting makers on the European continent annually exchange valuable papers with the American Foundrymens Association, giving details of the latest developments in foundry practice. Fortunately there exists a community of interest among com-



CAST Steel Outer Shaft Bracket, Made in Four Sections.

THE Cast Steel Stern Frame of the Queen Mary.



petent foundrymen in all countries, prompting cooperation for mutual benefit.

It happens that, in certain quarters where several important factors such as casting design appear to have been inadequately appreciated, a few engineers in America seem to have conceived the idea (doubtless without any intention of doing an injustice to the casting) that the product of the steel foundry should be given a dependability rank below that merited by the products of the welding and some other metallurgical arts, for manufacturing certain complicated vital parts customarily made of cast steel. Equipment for freight and passenger transportation, where the writer thinks the properly designed steel casting deserves not merely to hold but to advance its economic position of honor, presents a case in point where substitutional experiments have been made recently.

Certain views expressed on this subject during the last few years have caused the writer to be particularly interested in the extent to which steel castings were used in building the "Queen Mary," now regarded by many persons as the mistress of the seas. While much general information regarding this unique vessel has been published from time to time, the writer believes it is appropriate to mention a few of the details relating to size, before discussing those steel castings on which great dependence was placed for the satisfactory performance of the ship.

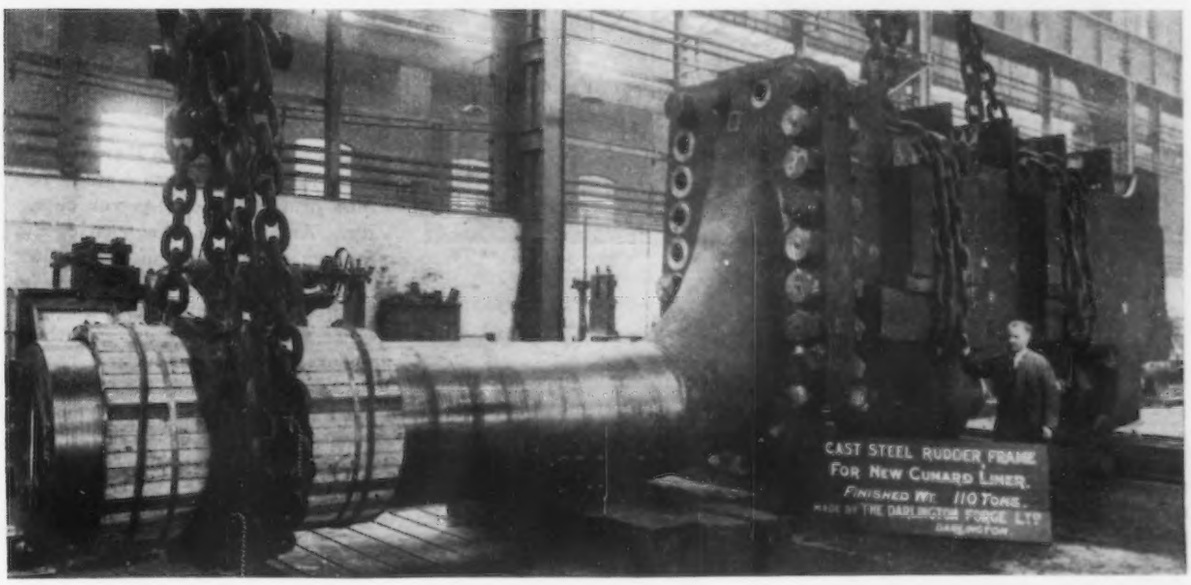
The "Queen Mary" has a displacement of 77,500 tons, is 1018 ft. long, and has a beam (width) of 118 ft. The distance from the bottom of the hull to the promenade deck exceeds 92 ft. Equipment for developing 200,000 horse-power was provided, to propel this vessel at the *required* speed of 28½ knots per hour. (Roughly, a knot is 1 1/6 miles.) Rivets are used for most of the joints on the ship, to the total number of approximately 10 million. Most of the steel plates have a thickness greater than one inch. So much for sketchy details giving some idea of size.

Before describing the ship's largest steel castings, it is not out of place to mention her propellers of manganese bronze, made in the foundry. When finished for installation each propeller weighed 78,000 lbs. They have a diameter of 20 ft., and without doubt are among the largest non-ferrous castings ever produced.

Turning now to the larger steel castings used for building the vessel, we find that they had a total weight of 1,344,000 lbs., exclusive of many steel castings of moderate size, such as turbine casings, fittings, etc. One of the accompanying illustrations shows the cast steel stern frame, made in five sections which together weighed 425,000 lbs. Five additional pictures are used to show other interesting cast steel parts. The outer shaft bracket, produced in four sections, weighed 403,000 lbs. The inner shaft bracket, made in two sections, weighed 269,000 lbs. The upper and lower parts of the rudder, combined, weighed 246,000 lbs. All weights here given are for the finished castings.

Because of the helpful efforts of a foundryman-friend in England, and through the kindness of The English Steel Corporation, Ltd., the writer was enabled to obtain the photographs from which the accompanying illustrations have been made. The steel foundry that manufactured the castings shown is operated by The Darlington Forge, Ltd., at Darlington, England. From the source mentioned above some interesting data regarding details of production were obtained for the writer, and are here abstracted for the reader's information.

The operations required for building the patterns, constructing the special molding pits, making the molds, pouring the castings, removing the molding sand, annealing the castings, removing gates and risers and otherwise dressing the castings, machining them, and conducting the prescribed tests, all



o o o CAST Steel Rudder Frame. o o o

A CAST Steel Shaft Bracket. o o o

required a period of about 18 months. Naturally much careful planning was necessitated, preliminary to the constant, keen supervision of highly experienced workmen. To mold the castings it was necessary to construct four large brick-lined, water-tight pits in the foundry floor. (Such use of pits is common in many American foundries where pieces of considerable depth are cast.) For the pouring of some of the castings, the needed quantity of steel required the simultaneous tapping of two open-hearth furnaces, acid-lined, each having a holding capacity of 60 tons. (The practice of tapping several heats to provide sufficient metal for individual steel castings of huge proportions, necessarily having large sink-heads, has been followed periodically in this country for a great many years.)

For the benefit of those who have no knowledge of ship construction, it may be explained that the stern frame—a picture of which perhaps is the most striking illustration here reproduced—ordinarily is a long curved part that is fitted into the after end of the vessel, and forms the contour from the keel to the upper part of the counter. The stern frame shown in the picture has bosses cast on it for applying the gudgeons on which to spring the rudder. The trunk, whose form will identify it to the uninitiated, may be seen plainly in the illustration. The rudder stock passes from the rudder itself through the trunk, and is connected through the ship to the steering mechanism.

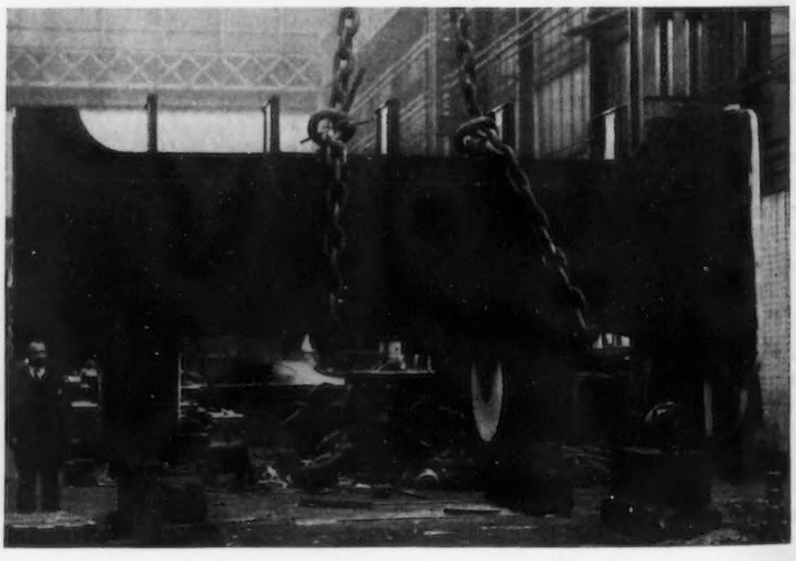
The two outer shaft and the two inner shaft brackets form the after bearings of the four propeller shafts that pass through the middle of the vessel. The lower rudder casting is of box-section. It functions as the main part of the rudder, and forms the foundation for the steel plates that were secured in place before the rudder was a complete unit.

Unquestionably the successful manufacture of these castings for the "Queen Mary" represents an achievement of which the producing foundry should feel very proud. The speedy and otherwise satisfactory performance of the ship indicates great skill in designing and constructing a huge vessel. The selection, production, and behavior of massive steel castings for very vital parts of the ship constitute an impressive demonstration of designing ability and metallurgical skill.

Each of the "Queen Mary's" four propellers has its own 4-stage turbine of 50,000 horse-power capacity. Among the steel castings of moderate size are the casings for high pressure and for the first intermediate pressure for the turbines. Readers who know something about marine construction realize that turbine casings for high pressure customarily are made of cast steel in America, whether for merchant vessels or for Navy ships.

Altogether (of course including wrought steel mostly) there are said to be 50,000 tons of metal of many varieties in the hull and machinery of the "Queen Mary." And

(CONCLUDED ON PAGE 134)



o o o THIS Steel Shaft Casting Was Part of the Equipment.

PROBLEMS *in* ELECTROGALVANIZING ROUND WIRE

By ERNEST H. LYONS, JR.

Chemist, The Meaker Co., Chicago

DIFFICULTIES in electrogalvanizing round wire are those which have perplexed electrogalvanizers in every field for many years, but they are intensified in the case of round wire. The two major difficulties are removing drawing compounds imbedded in the wire surface, and obtaining good, dense coatings at high current densities. Commercial processes have been put in operation by U. C. Tainton at the Bethlehem Steel Co., by the Langbein-Pfanhauser Works, and by the Meaker Co., Chicago. The outstanding qualities of electrogalvanized wire are perfect adhesion, density, ductility, and purity. Operation and maintenance of an electrogalvanizing plant are simple and economical, and control of the coating is accurate and easy.

IN its recent strikingly successful application to round wire, electrogalvanizing has achieved new conquests over difficulties which have beset it on every hand since its discovery. So great have been these difficulties that, although electrogalvanizing was practised more than a century ago by Dr. John W. Revere of New York[1], it was almost unknown to industry until 1900. During this period, investigators were struggling with the problems of current supply, stability of solutions, methods of control, attaining commercial speeds, working out ways of handling, etc.

In the 19th century the major problem lay in obtaining a reliable and economical source of current. The earliest patents on electrogalvanizing[2] mentioned voltaic batteries, which of course were not feasible commercially. Although the first practical dynamos appeared about 1880, some 20 years of development passed before they became entirely reliable and efficient as sources of heavy, low-potential currents.

As the early electrogalvanizing solutions permitted the use of current densities of only 5 to 20 amperes per sq. ft. of surface being galvanized, zinc was deposited at the rate of ¼ to 1 oz. per hr. on each square foot of surface—too slow for general application. Not only was the plating slow, but the control was so uncertain that the work was frequently unsatisfactory.

The first electrogalvanizing solu-

[1] American Encyclopedia, Vol. 8.

[2] Wall, English Patent No. 951, 1852; Person, English Patent No. 951, 1854; Puls, English Patent No. 1276, 1855; Brown, English Patent No. 1175, 1857.

tion with which current densities of 70 amperes per sq. ft. and higher could be used was introduced by the Meaker Co. in 1905. With this speed, electrogalvanizing was extensively applied to many types of products; indeed, not long afterwards the first full automatic machines were built for electrogalvanizing.

The next problem was that of cleaning, for even the best electrogalvanizing solution could not produce good work on imperfectly cleaned material. Today, as the result of long experimentation and practical experience, a variety of cleaning sequence is used. Normally there are two steps: (1) the removal of grease and oil, ordinarily by the action of a hot alkaline solution, with or without the use of electric current; (2) the removal of oxides and scale, commonly accomplished by acid pickling, sometimes with the aid of current. The fact that each step consists of several dips, with necessary rinses, as worked out to meet the requirements of each case, is evidence that cleaning is both important and difficult.

Cleaning Round Wire

Especially is this true of round wire. The adhesion of the galvanized coatings depends on cleaning, for a coating will not adhere to an imperfectly cleaned surface. Not only is round wire called upon to withstand more drastic adhesion tests than is strip steel, which has been successfully electrogalvanized for some years, but round wire is afflicted with unusually stubborn dirt. With ordinary methods of cleaning, electrogalvanized coatings on round wire do not approach the degree of adhesion obtained by the same methods on strip steel. Customary processes of electrocleaning, pickling, and electropickling, are inadequate; yet better adhesion is required on round wire than on strip steel.

The inordinate difficulty in cleaning round wire is doubtless connected with the incorporation of drawing compounds into the very surface and pores of the steel. These compounds, which facilitate the drawing operation, are imbedded and fused into the steel surface by the severe work done on it by the die. Owing to the resistant chemical nature of many drawing compounds, as well as their physical condition on the wire, their removal has baffled many investigators.

Several cleaning processes have been developed only to be abandoned for one reason or another. With wire running at speeds comparable to those used in hot galvanizing, the time during which the wire is undergoing cleaning is necessarily short; otherwise the cleaning baths will be prohibitively long. Some processes were not sufficiently rapid, others were simply unable to remove the varying impurities from the steel surface. Some worked satisfactorily for a time, and then failed to clean the wire; some used excessive amounts of chemicals; and others produced undesirable effects on the physical properties of the wire, for example, hydrogen embrittlement.

Whereas it is possible to wipe a light smudge from the surface of strip steel passing through a machine, no satisfactory wipe is known for round wire; the cleaning must be entirely chemical. A further difficulty is encountered when the wire has been normalized or annealed in a bath of molten lead. On strip steel this results in the burning off of oil and grease, which are the main impurities; but on round wire the drawing compounds are fused into an enamel-like coating more difficult than ever to remove.

The first process to attain commercial success in the United States was developed by U. C. Tainton for the Bethlehem Steel Co., as a part of Bethanizing[3]. The wire is made the cathode in a bath of fused caustic soda and soda ash. The nascent sodium should surely reduce all oxides and scale with ease, and dissolve or destroy grease and other impurities. After this ingenious cleaning, it has been found desirable to include an electropickle. When the difficulties of handling fused caustic are considered, the stringent demands made upon the cleaning process will be recognized.

Several other methods of cleaning are now in use, such as those developed by The Meaker Company, and by the Langbein-Pfanhauser Works in Germany[4]. While the latter is used in Europe, no commercial installations have been made in the United States, and little detailed information is available. The Meaker process, which is in commercial operation in this country, although not involving excessively corrosive chemicals or high temperatures, not only cleans the wire, but also etches it to the degree favorable for close adhesion of the zinc coating. It does not produce embrittlement or otherwise alter the physical properties of the steel.

It consists of a brief pickle supplemented by three unique operations so that even when almost no free acid remains in the pickling solution, cleaning continues to be rapid and thorough. Consequently the pickle acid requires replacement only at long intervals, while the reagents in the other steps maintain their efficiency even longer. So powerful and stable is this cleaning process that the stringent demands made on it are fully met in the space of a few seconds; and yet almost no control or replenishment are necessary.

The Electrogalvanizing Process

Experience in the continuous electrogalvanizing of strip steel has pointed the way for round wire galvanizing. On account of the perfect control and uniformity of coating thickness inherent in the electrolytic method, electrogalvanizing has been almost universally adopted for strip steel, where the specifications are exacting; for in hot-dipping the molten zinc cannot be wiped off with any degree of uniformity. Almost all strip steel is now electrogalvanized in a special Meaker electrolyte developed for this purpose.

Because round wire has no edges where the coating is apt to burn, current densities as high as 700 amperes per sq. ft. may be used even with ordinary galvanizing solutions. To obtain satisfactory adhesion and toughness of coating, the solution is kept at a high acidity, favoring the liberation of hydrogen. Zinc deposited from an ordinary solution is, therefore, somewhat more porous than has been common in electrogalvanizing, and requires burnishing and polishing to make its appearance satisfactory.

In order to avoid this difficulty and produce a dense, non-porous coating, The Meaker Co. has developed a galvanizing solution which is claimed to plate smoothly and efficiently at current densities as high as 1500 amperes per sq. ft.

[3] The Iron Age, April 2, 1936, p. 45.
[4] Weisselberg, The Iron Age, May 21, 1936; Vol. 131, p. 34.

without excessive acidity. Coatings being produced commercially from this solution have a bright matte finish which does not require burnishing, and which retains its color in storage. The zinc is exceedingly dense, ductile, pure and adherent. It does not occlude acid or hydrogen.

Properties of Electrogalvanized Wire

Properly electrogalvanized wire will withstand amazing tests with regard to adherence and ductility. Even when coatings as heavy as 3 oz. per sq. ft. are applied, the accepted test of wrapping the wire in a coil around its own diameter is passed so easily as to be of no significance. The wire may be bent back on itself and crushed in a vise until the steel breaks, and yet no sign of cracking or peeling of the coating will be seen, even under a microscope. If some care is exercised in the test, and the wire is opened out cautiously, the two separate pieces of steel will remain connected only by a small portion of the zinc coating which has not yet been severed, and which is sufficiently ductile to act as a hinge. The wire may be rolled into a flat strip, or drawn down to a smaller diameter without injuring the coating. Electrogalvanizing, whether by the Bethanizing, Langbein-Pfanhauser, or Meaker process, does not affect the physical properties of the wire.

The mechanical difficulties of handling wire have long since been solved by the hot galvanizers, but it is not easy to provide good electrical contacts to maintain extraordinarily high current densities on the surface of steel wire, which is not a good conductor of electricity. While providing continuous and perfect connections, the contacts must allow kinks, emergency splices, and other variations in the wire to pass through without injuring the contact, breaking a part of the machine, or becoming entangled with neighboring strands of wire.

With the high currents used, treeing is very rapid and may be troublesome if the contacts are improperly designed, occasioning not only a loss of metal and probable short circuits, but filling the solution with bits of broken "trees," which will cause roughness in the galvanized coating.

In view of these difficulties it is not surprising that electrogalvanizing round wire has not been extensive until now. As early as 1904, an engineer of a large American Steel company investigated the Szirmay process which was being used on a small scale in Austria for round wire. He reported that the electrogalvanized wire was superior in quality to his company's hot-dipped wire, more than overbalancing the slight disadvantage in cost of production. The Szirmay patent covered the galvanizing solution, which was regarded as the key to the whole problem; it was the lack of appreciation of the other difficulties involved which prevented the development of the process.

In 1905, Guy L. Meaker[5] invented a process for electrogalvanizing round wire which was the forerunner of the present Meaker process. In it the solution was obtained by leaching zinc ore with the spent, acide electrolyte from the galvanizing tank.

What a contrast between these earlier plants, which ran slowly (20 ft. per min. in the Szirmay process) to produce thin coatings on imperfectly cleaned wire, and the modern Bethanizing or Meaker process installations which operate at 10 times the speed and apply a coating which is up to 30 times heavier.

Operation of an Electrogalvanizing Plant

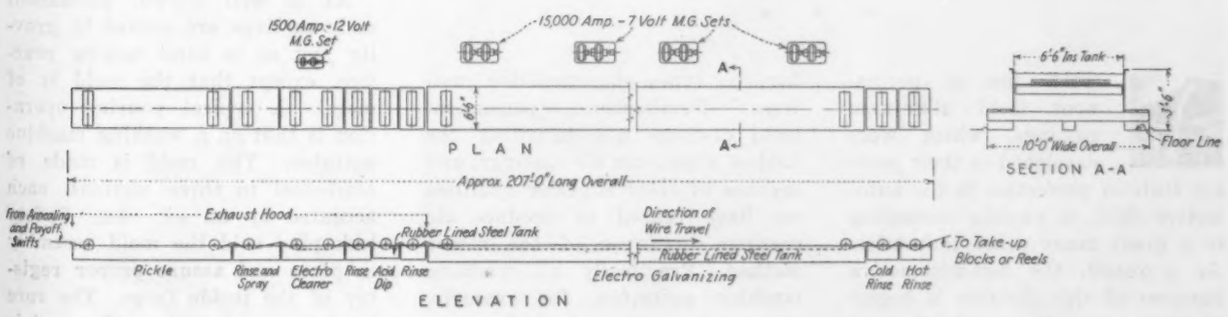
Where hot galvanizing employs heat, electrogalvanizing uses power, and the comparative costs of the two processes will depend on the respective costs of heat and power in a given locality. No wide variation in operating cost is anticipated, or has been experienced in modern practice.

Operation of an electrogalvanizing machine is simple, being continuous and fully automatic. All that is required is the loading of bare wire on the pay-off swifts, and the removal of galvanized wire from the take-up reels. When a variation in the thickness of coating is desired, the operator merely adjusts the speed of the pulling mechanism and the rheostats of the generator circuits. He knows beforehand exactly what coating will be applied for each setting and gage of wire, and this coating is maintained precisely uniform, foot after foot, mile after mile, until the controls are readjusted.

Turning off the generators, water, and pulling mechanism shuts down the machine, which then stands without loss or change, ready to resume operation at any moment.

The galvanizing solution, automatically maintaining itself by dissolving zinc from the anodes in the exact quantities being plated out on the wire, requires only the replacement of anodes as they are consumed, and an occasional check on the acidity by means of one of the convenient pH test sets now available. Operating without splashing, slopping, or fuming, the machine is inherently safe and clean, and demands very little attention.

[5] U. S. Patent No. 799,860.



Plan of electrogalvanizing machine for 40 wires.

PERMANENT MOLD CASTINGS *in* ALUMINUM

By R. J. ROSHIRT

Manager, Permanent Mold Division
Bohn Aluminum & Brass Corp.

DEVELOPED in the automotive field, the process of casting aluminum in permanent molds is rapidly spreading to other industries. Castings for a great variety of parts weighing from an ounce to 25 lb. are made by this process for washing machines, vending machines, vacuum cleaners and a host of other products. The metal is said to be about 20 per cent stronger than a corresponding aluminum die cast part.

THE use of permanent mold aluminum castings, which were developed to their present state of perfection in the automotive field, is rapidly spreading to a great many other industries. As a result, the non-automotive business of this division is beginning to rival the production of pistons, cylinder heads and other familiar types of automotive castings. Furthermore, permanent mold castings are usurping the field of aluminum die castings, and because of their superior qualities we have ceased to produce die castings in favor of the newer method. Practically all washing machine agitators, for example, are cast in permanent molds today. Permanent mold castings are also used in vacuum cleaners, automatic vending machines, electric ironers, radiators for heating, floor polishing machines, typewriters, shoe repair machines, aircraft parts and many other machine elements. These castings range in weight from one ounce to 25 pounds or more.

As is well known, permanent mold castings are poured by gravity just as in sand casting practice, except that the mold is of metal. A typical pouring operation is that on a washing machine agitator. The mold is made of semi-steel in three sections, each actuated by an air ram. Safety lock pins hold the mold assembly in place and assure proper registry of the inside faces. The core is also a semi-steel casting and is lowered in place vertically by a

fourth air ram. Molten metal is poured from a hand ladle through a central spout and is distributed through three gates.

The gating must be generous, particularly where the gate joins the casting proper, since gravity alone forces the metal into the mold. The gates and sprues are sawed off in bandsaws as the first finishing operation and are remelted into additional castings. Fins and other projections are chipped off by air hammer, hand filed or both. With a circular casting like an agitator, it is possible to chuck the piece in a lathe and turn off the fin at the edge. Much of the cleanup work is performed on cloth or glued abrasive wheels.

High Strength of Castings

Molds are made of semi-steel or high-test cast iron. They can be cast to shape from wood patterns and the finishing cost therefore is low. They need not be made from the highest grade die steels and machined from the solid blank, as is true for die casting dies. The principal advantage of the permanent mold technique, however, is not the lessened die cost, but the fact that no air bubbles nor gases are entrapped. Hence the chilling effect of the metal mold produces a dense homogeneous metal that is at least 20 per cent stronger than a die casting.

In die castings, the metal is forced into the die under pressure and gas pockets and voids within the metal are trapped sometimes and concealed under the surface of the casting. Hence the tensile strength, yield point and elongation are higher for permanent mold castings than for either sand castings or die castings. Moreover, they can be greatly improved physically and mechanically by proper heat-treatment. The possibility of included gas precludes the heat-treatment of die castings. For the same reason, thermal conductivity is lowered. Then, too, in the polishing of aluminum die castings porous spots or small blowholes may be opened, giving the casting a spotted or mottled surface. Permanent mold castings having a dense homogeneous metal all the way through give a much better polish, although the initial surface is rougher. Check marks in die faces are not nearly so common in permanent molds as

IN permanent mold casting of aluminum, sectional mold pieces made of semi-steel are mounted on an air ram to facilitate assembly and disassembly and extraction of the casting.

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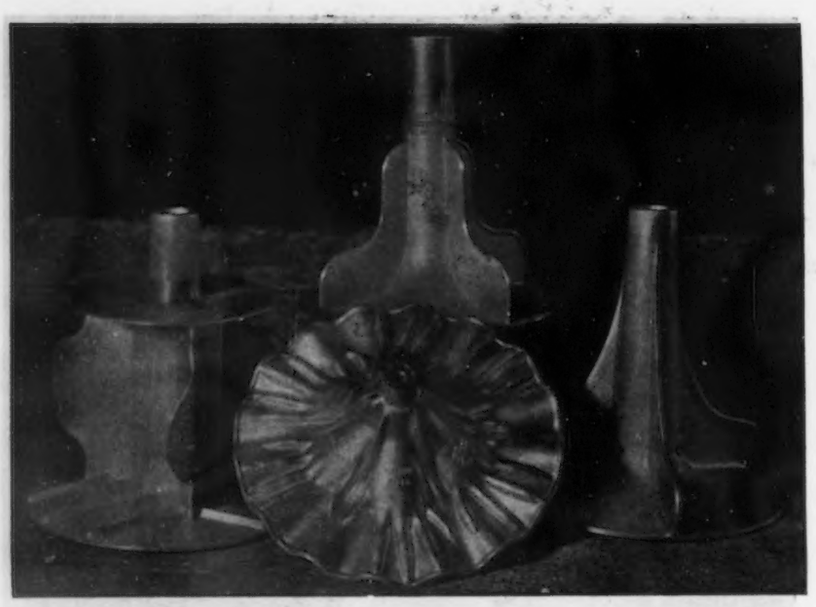
o o o GATES and fins are trimmed off in the bandsaw.



PRACTICALLY all washing machine agitators are cast in permanent molds today. The interesting piece in the foreground is a Thor "Gentle Hand" agitator.

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they are in die casting dies. Absence of pressure may be a factor. Die erosion is also lessened. A slightly mottled appearance is present, but this surface cleans up well.

Where the internal shape of the casting is such that a metal core is not practical, the use of a die casting is obviously out of the question. A semi-permanent mold casting using a semi-steel mold and dry sand core is practical, however, and the resultant casting possesses all the advantages of a permanent mold casting. Sand cores are shaken out in the usual way.

With many of the newer alloys, permanent mold castings can be greatly improved physically by proper heat-treatment. In fact, the availability of these higher strength alloys in cast form has created new markets for this material. One of the illustrations shows three such permanent mold castings where low weight and high strength are combined. The airplane landing wheel is an intricately cored structure subject to severe shock loads. In the middle is an automotive supercharger

HERE are several permanent mold casting alloys that lend themselves to heat-treatment for high strength. Left: airplane landing wheel; middle, supercharger impeller; right, stern post for outboard motor.

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impeller which must withstand high bursting stresses at speeds up to 40,000 r.p.m. At the right is a rudder post for an outboard motor, another part subject to shock loads. Like the landing wheel, it is sand cored for obvious reasons. Other outboard motor parts include gear housings, crankcases and swivel brackets, etc. Another part typical of what is possible with a heat-treated alloy is an aluminum bicycle fork.

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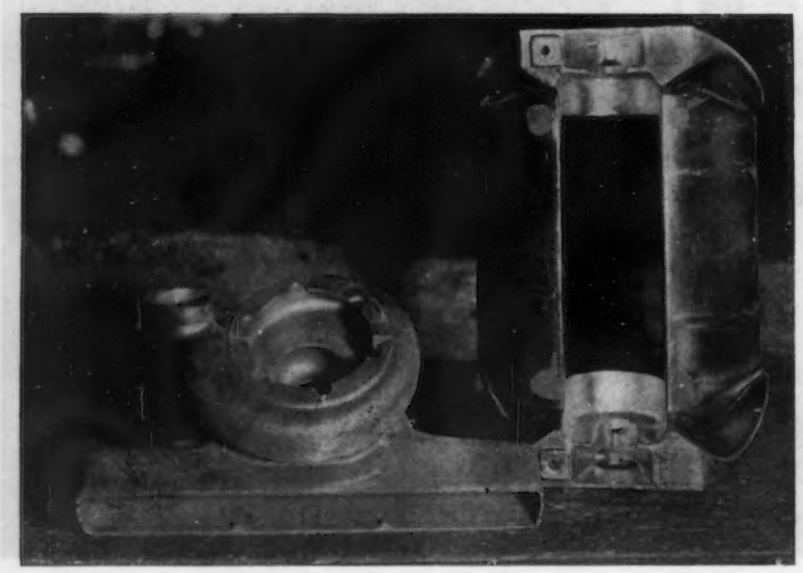
THE vacuum cleaner case is typical of a semi-permanent mold casting, employing a dry sand core that is subsequently shaken out in the usual way.



ROLE OF THE FABRICATOR *in* DEVELOPING STAINLESS STEEL MARKETS

By J. C. C. HOLDING

Vice-President and Manager, American Stainless Steel Co., Pittsburgh

"CONSUMER ACCEPTANCE" is a favorite phrase with the advertising fraternity, and there is no discounting the fact that a product or a service must register big with the ultimate consumer if it is to bring satisfaction and success to its manufacturer or its seller. However, there is frequently a middleman between the metal manufacturer and the ultimate consumer whose favor and influence go far toward bringing about ultimate consumer acceptance. His reticence, to say nothing of his positive opposition, may long delay and possibly prevent the general acceptance of a product whose merits seem incontrovertible to the manufacturer.

Such has been the case with stainless steel. The fabricator has been slow to accept the merits of this metal. The public, that is, the ultimate consumer, was prone to accept the claims of the patent owners and some of the manufacturers as promulgated in the early advertising and this, frankly, was the very object of the first advertising campaigns.

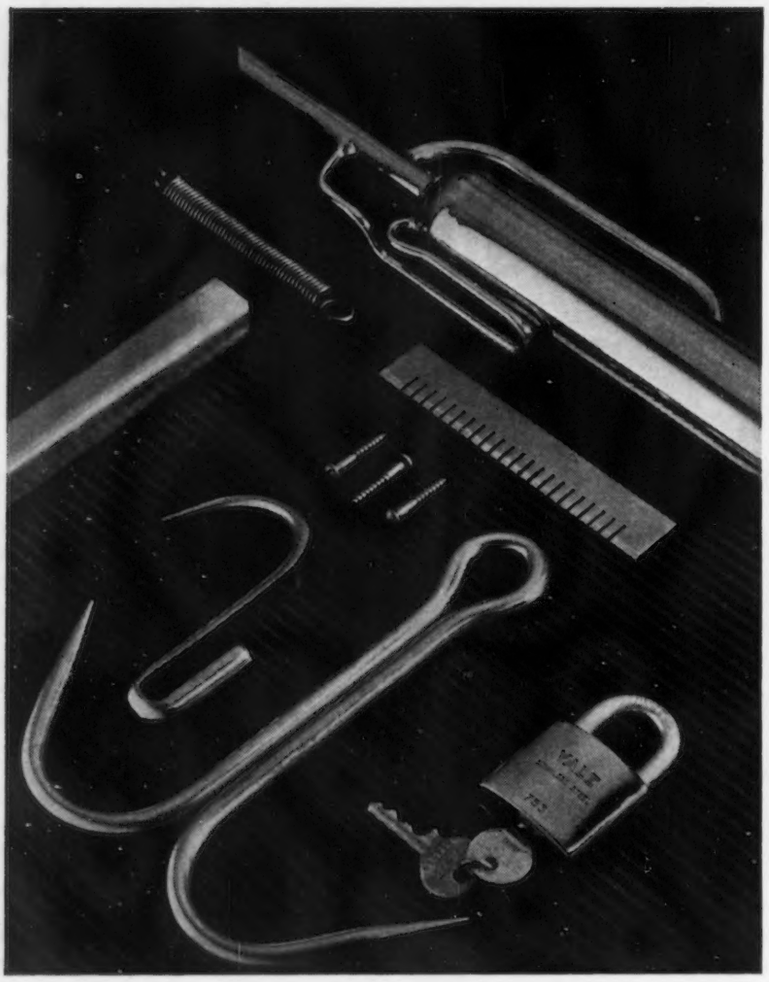
It soon became apparent that Mr. and Mrs. Public were getting tired of asking their dealers for stainless this and that, only to be told that they were not yet on the market. Why were they not on the market? Simply because the fabricators—the middlemen between the makers of the material and the consumers of the finished product—had not been sufficiently "sold" on the stainless idea to induce them to change their dies and equipment, slow down their routine processes of production and enter a virgin field where sales might or might not justify the expense and delay incident to the change over, even for a small part of their normal output.

Insistent demand by the public for stainless articles, augmented by efficient coaching of fabricators by the steel manufacturers, have resulted in a progressively increasing consumption of stainless steel in the United States from year to year, even through the depression, until it has reached a very considerable annual tonnage, estimated for 1936 at 100,000 tons.

Market Only a Decade Old

It has taken only a comparatively few years—about 10 or 12—to accomplish these results, for, al-

though the original stainless steel patents were granted in 1916 to Harry Brearley and in 1919 to Elwood Haynes and to Benno Strauss, very little effort was made for several years either by the patent holders or by the manufacturers to exploit the material. As usual, it required several of the early years of the life of the patents for anybody to catch the enthusiasm of the inventors or discoverers of these remarkable alloys. Then, too, the Government's embargo on the use of chromium during the World War for other than war purposes prevented any extensive production under the first, or Brearley patent, which called for 9 to 16 per cent chromium in the alloy. At any rate, production scarcely got started until 1922 and, in anything like noteworthy volume, not until 1925.



JUST a few of the many items made of stainless steel.

The first direct effort to interest a fabricator was made by one of the patent holding companies when it induced a maker of cooking utensils to undertake the fabrication of a fairly complete assortment of stainless steel frying pans and sauce pans. These were extensively advertised to create a public demand, but many serious fabrication problems in connection with the drawing, spinning and polishing arose which seriously delayed the production of anything like satisfactory utensils. The problems were only solved by the closest cooperation of the supplier of the material with the fabricator. Much patience was required both on the part of the steel manufacturer and the utensil maker, and in the meantime the patience of the public was tried by the scant supply, the limited geographical distribution and especially by the high prices it was necessary to charge. Eventually success crowned the combined efforts of mill experts and fabricators, and the stainless cooking utensil market is now firmly established and is being adequately supplied by not only the pioneer fabricator in this field but by many others. This is a good example of the beneficial results to the stainless industry as a whole to be had by arousing the interest of a fabricator and then helping him to get into the market with a creditable product.

The next concentrated effort in this direction was made with a manufacturer of golf clubs. Exactly the same tactics were pursued as in the kitchen utensil case. One prominent club maker was selected. His interest was aroused by pointing out to him one outstanding consumer appeal his stainless clubs would have—that since they would not rust nor stain they would, in the hands of the golfer, soon more than repay him for their necessarily higher cost by saving him the monthly charge made by his professional for cleaning ordinary clubs. Sold on this market advantage, the manufacturer agreed to undertake the pioneer's role. With the constructive suggestions of the steel manufacturer, added to his own initiative and resourcefulness, he was soon able to overcome the forging and polishing handicaps which the new, tougher material presented and had the great satisfaction of placing on the market the first stainless steel golf clubs made in this country—another triumph for the cooperative spirit among patent owner, rolling mill and fabricator.

These and similar early and more or less isolated educational contacts between mill and fabricating customer paved the way for what soon became the universal practice of the steel mills, that is, to give their fabricator customers the benefit of every bit of information their metallurgical and research departments could develop that might help the fabricators to become larger users of this new metal. In fact, the problems submitted by their customers stimulated the experts at the mills not only to redouble their efforts to make the metal more workable in the fabricators' standard processes, but in addition to devise new methods and processes which would improve their customers' existing practices.

This naturally involved the better

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WHAT I THINK *of the* EMPLOYEE REPRESENTATION PLAN

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By an Employee Representative

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MUCH has been written by management about employee representation plans. Enemies of the plan have been exceedingly articulate in attacking it, but very few, if any, employee representatives have given publicly their views as to what it is, how it works, and what its future prospects are. The author of this article, F. W. Bohne, employee representative in one of the country's largest steel works, is also chairman of an employees' central committee representing thousands of workers. What he has to say is not given in an official capacity but is his own personal conviction on the subject, gained through actual experience. As a matter of interest, the article is presented at a time when considerable attention is being directed to activities of the various plans of employee representation in the steel industry.

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SIMILAR to political government, the effectiveness of an employee representation plan depends on the character of the representatives elected by the employees, and the company representatives appointed by management. Because the plan is a mutual agreement between management and the employees for a procedure of adjustments by conferences, it can be justly called an employer-employee cooperative system.

The plan with which I am connected provides for the representation of all employees, and it aims to give to every employee a chance to have his grievances adjusted and his wrongs righted. It should make them happy and contented with the assurance of just and fair treatment, and create good will and sincere cooperation. It is not 100 per cent perfect but it is by far the best arrangement that has as yet been offered to the workmen for their protection.

Such a collective bargaining agency cannot operate successfully unless employee representatives and management are determined to meet each other honestly and with open minds. This must be the purpose of all from the head of the company down to the humblest employee, or eventually the plan will fail, and bring with its failure a disturbance to peaceful and harmonious relations between the company and its employees. Neither side should make unfair or unreasonable demands nor obstruct or evade a fair adjustment. Good

will cannot be promoted if either management or the employees hold mere expediency above the principles of justice and fair play.

When our plan was first inaugurated it was a new idea in the company, and a tremendous responsibility for its success rested upon the chosen representatives of both employees and management. Like any new undertaking, the early history disclosed mistakes, suspicion, and misunderstandings, but it is only by the experience of past procedure that any plan of this type can be made to evolve into a satisfactory working vehicle of adjustment. In due time the employees, through proper selection, elected as their representatives leaders whom they felt they could trust to deal honestly and courageously with management on their behalf. Officials at the top of the company were keen in realizing that the success of this new venture depended as much on management as on the employees. Foremen were definitely instructed concerning the aims and purposes of the employee representation plan.

A Steady Improvement in Results

From the time of its inception, there has been steady improvement in both the operation and the results of the plan. Employees have a greater respect for management, due in most cases to their happy selection of the proper men to represent them. Foremen, on the other hand, while humanly hostile in the beginning, now in most cases cooperate fully with the employee representatives. In fact, there are a great many problems involving employees which never reached the joint conference committee meetings. This is because the management and the employees' representatives have gotten together and corrected the situation under discussion. It would be foolish for me to say that all foremen cooperate, but I can truthfully state that in my own experience by far the majority of both employees and foremen show every tendency to cooperate in such a way that the success of the plan is furthered.

Often times the impatience shown by employees, because an immediate decision is not given, is unjustified. Many problems which arise must go through proper channels before a decision is reached. In many cases appropriations are necessary which in turn must travel through routines set up by the company in order to carry on its affairs in a businesslike way. The majority of employee representatives know these things, but it is sometimes hard to convince a constituent that his request will be granted, but a little time must be consumed in carrying the project through.

This brings up a question which I understand has been in the minds of those unfamiliar with the workings of the employee plan—how do we know what our employees want and how do we carry back to them the decisions of management? In the first place, employee representatives are in constant contact with the workers who have elected them for representation purposes. This is done by personal contact, meetings, telephone and letters. There is ample opportunity, and it is taken advantage of, for the employees to contact their representatives. The same procedure of course applies when we representatives take the decisions of management back to the employees. These decisions and the discussions surrounding them are all recorded in the minutes of meetings held, copies of which are available to employees.

No Dictation

I might also say here that as long as I have been a representative no member of management has dictated to me what I should do. To those well acquainted with the plan of employee representations, this is of course obvious. But to those not having correct information on the workings of the plan, it will serve as an answer to accusations made by foes of this form of collective bargaining.

Representatives Take Their Duties Seriously

One of the reasons for impatience on the part of employees is because they do not realize the conditions faced by the representatives. Many important projects and requests must be honorably discussed pro and con with management before a final decision is reached. In fairness to the employees, however, I must say that management has at times shown a tendency towards negligence and procrastination in giving a decision. A few of the employee representatives, in their impatience, are beginning to follow radical malcontents. They do not realize that they are jeopardizing an advantage other employee representatives were acquiring, not by any threatening methods but by merits of fair and just arguments actuated by motives of good will and cooperation.

The representatives as a whole have been loyal and conservative,

and have considered their duties seriously. They have not been indifferent, apathetic, or meandering around without a purpose. For if they had, the plan would have failed. Most of them have been hard working, conscientious and organized to work together, willing to go in the same direction. What they have accomplished will be appraised in time, and by their character and adaptability for leadership they make the cause greater than themselves. It is the duty and responsibility of management to see to it by their prompt and fair dealing with the representatives that the harmonious relationship now existing continues. We now have up the question of wage increases for our employees, and have endeavored for months to convey our desires to management and convince it of the justice and the need of adjustments. Management on the other hand have told us how they feel about it. Further meetings have been called and will be called to go into every detail of the question until a fair and just decision is eventually reached. This is collective bargaining. No demands or requests are ever decided on the spur of the moment. Life doesn't run that way. The representatives will not be indolent in their efforts to get for their constituents what they feel should be granted, and will persevere no matter how painful it might be to remain faithful to the principles of justice and honor.

From the foregoing, it is perfectly obvious that the plan of employee representation has already accomplished much for the welfare of employees. A relationship exists between management and the workers freer from suspicion and distress than at any time in the history of employer-employee contacts. While management and representatives differ sharply on many problems, they are able to keep their heads long enough to intelligently discuss their differences of opinion. The plan has been directly responsible for a better selection of foremen and a broader attitude on their part towards the workers. This particular condition has been the result of cooperation on the part of top management and goes a long way towards solving some of the employer - employee relation difficulties.

Many of those who disagree with us over the effectiveness of the plan of employee representation, insist that we have no power to carry out what we consider just demands after they have been turned down by management following long deliberation and discussion. Let me say that we have provision for arbitration, the details of which will certainly be broadened in the future. And let me also say that outside unions do not have a monopoly on the right to strike.

A Final Word

One final word about what our plan has gained for the workers. Our minutes show two-thirds of total requests and projects decided in favor of the employees. I have mentioned the closer and healthier attitude on the part of employees and management for each other. It is perfectly true that the vacation plan with pay was a result of negotiations between employee representatives and management, and if and when wage increases are granted, it will be because of the effectiveness of the plan of employee representation and not because of the activities of outside agencies. The progress and evolution of our plan is without end. If the employee representatives and management have enough power of conception and elevation of character to understand the nature of justice to the workmen and to the company, and will approach the issue with mutual confidence, fair play, and just dealings, their efforts will reach a successful conclusion and the industry will enjoy a new era of industrial peace and prosperity. The plan can fail but it won't if the above policy is adhered to. The tremendous responsibility resting on employee representatives and management cannot be taken lightly at any time.

AUTOMATIC CONTINUOUS ARC WELDER EMPLOYS TAPE COATED WELDING RODS

A NEW development in the arc welding field is the use of the shielded arc in automatic arc welding with a metal arc welding head and the automatic coating of welding rods with a flux tape. The method of coating has been developed by Una Welding, Inc., Cleveland, and tape coated rods are being used with the company's automatic arc welding machine.

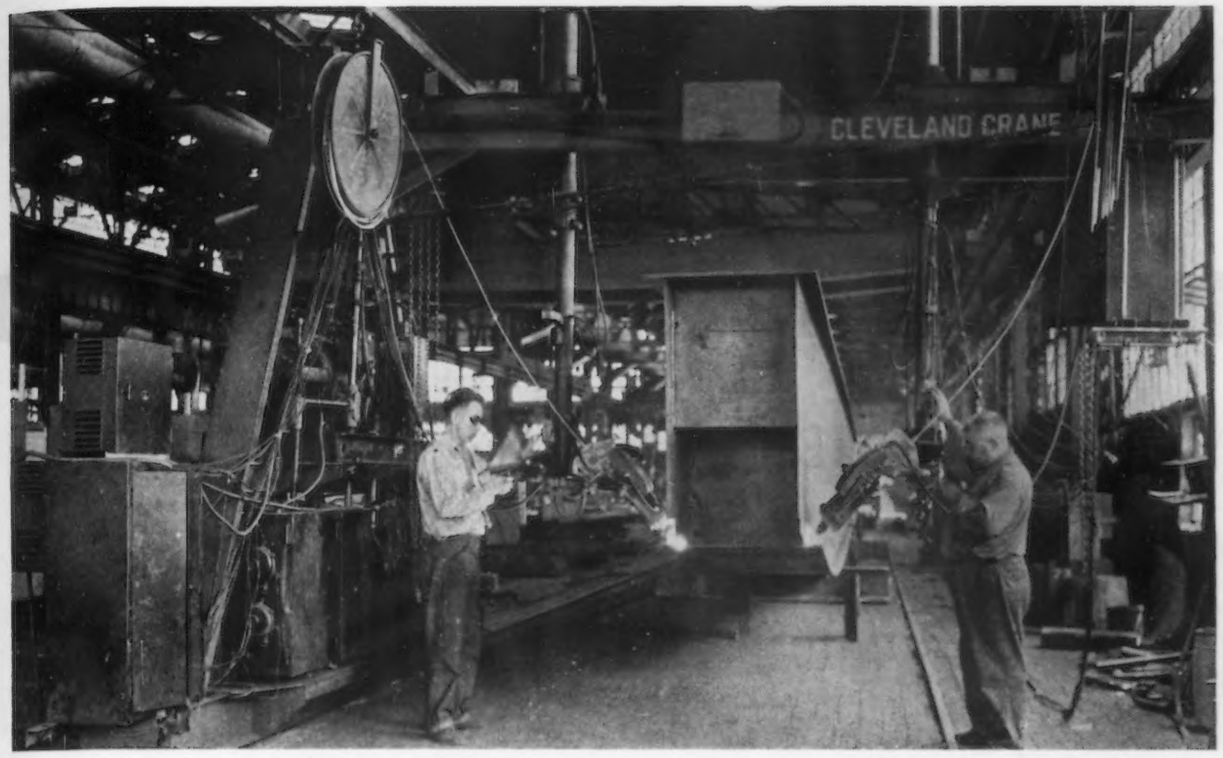
The coating is applied at a point directly above the arc. While the welding rod is moving from the welding head to the work the impregnated tape is wrapped around the wire longitudinally by a series of rolls.

Attached to the bottom of the welding head is a box-inclosed mechanism through which the rod is fed after it leaves the welding head. The rod is drawn through two rolls and then passes through contact brushes. As the coating has not yet been applied, the rod is not insulated at that point and a positive contact between the brushes and wire is effected.

The flux-impregnated tape is fed from a reel into the tape coating device through a slot in the side of its housing and passes vertically between a grooved roll and the rod to give the tape an initial bend partly around the wire. About 3 in. below this roll are two other rolls driven by a chain from the set of rolls located above the brushes. This lower set of rolls, one of which is a tension roll, pulls the wire through the coating device and completes the operation of firmly wrapping the tape around the rod. The coated rod moves along a few inches until it reaches the arc.

Rod Has Serrated Surface

The welding rod used has a lightly serrated surface. The first step in processing this rod is the application of a protective slag coating which is put on by passing the wire through a composition with paste-like constituency. The serrations on the wire are said to permit the better adherence of this preliminary coating to the wire and also help to assure positive feeding when the rod is drawn through the rolls. A sufficiently large area is left between the dent to allow for



AUTOMATIC arc welding of a 91-ft. box-type crane girder by the use of the shielded arc method in the plant of the Cleveland Crane & Engineering Co.

direct current contact to the wire. The rolls themselves have knurled faces in order that they may take a good grip on the rod.

The tape is impregnated with a slag and gas forming coating. Some variation in the thickness of the coating on the tape is permissible as the rollers in the device for forming the tape to the rod are adjustable. The two coatings on the rod and tape form a protective slag that blankets the weld metal and produces a blanket of reducing gases around the weld which prevents atmospheric contamination.

Either a.c. or d.c. current may be used for welding with the tape coated wire. Ductility of the weld metal is said to be 20 to 30 per cent, or approximately the same value as the parent metal.

An automatic welding head with the use of this coated rod will weld steel ranging in thickness from a No. 10 gage sheet up to a 3-in. plate.

Welding with rods coated by the new method is now being done with the Una automatic arc welding head, which heretofore has used bare or light coated welding rods. With this head the arc length is controlled by two independent motors operating against each other through differential gears. This permits instant reversal of the welding wire travel without reversing the direction of rotation of either motor. One motor operates at constant speed and the other, the controlling motor, operates at a varying speed depending on the arc voltage. The ratio of the differential gearing is such that a difference of approximately 300 r.p.m. in the speed of the two motors gives an electrode feed equal to the melting rate of the electrode under average conditions.

AUTOMATIC arc welding head equipped with mechanism housed in the box-shaped lower section in which a flux impregnated tape coating is wrapped around the rod at a point between the welding head and the arc.

The tape coated wire is being used with Una automatic welding heads for the continuous welding of box type crane girders at the plant of the Cleveland Crane & Engineering Co., Wickliffe, Ohio. Heavy plate members that form 91-ft. crane girders were welded together at a speed of 32 ft. per hr. as compared with 22 to 24 ft. per hr. when light coated wire was used for welding this class of work. The welds were 7/16-in. fillets made with ¼-in. wire.

The new method has wide applications, as it may be used for fillet, butt, lap, and vee or groove welds and for single and multiple beads and in welding light and heavy material. Long lengths may be welded without interruptions. Full size 150-lb. coils of wire may be used. Advantages claimed for this new Unamatic arc welding process as compared with manual welding are that the welding speed is increased, the weld is more uniform in density, porosity and craters are eliminated and there are no short welds to be lapped together. Another advantage emphasized is that the process permits an operating cycle of 100 per cent, largely eliminating the human element in arc welding.

IMPROVEMENTS IN PRODUCTION

Vertical Deep-Hole Boring Machine Has Automatic "Catpaws" Bar Support

IN a new, vertical, deep-hole boring machine, announced by the Baush Machine Tool Co., Springfield, Mass., the assembly of a heavy steel base and a rigid cast-iron column provides the design foundation for both work-tool head and fixture or work-piece mounting.

An overhead, center-feed principle of operation is employed through mechanical features consisting of a patented hydraulic-feed cylinder mechanism mounted on the top of the column; a work-tool head; a main-slide-mounted support arm, carrying an adjustable take-up bushing for the boring-bar tube; and a longitudinally-moving table on which the work fixture or work piece is held.

The first three units are maintained in direct alinement by taper gibs on front and side of T-ways. The table-mounted work piece, on which boring is to be done, is placed in this alinement.

Within the boring-bar tube, which has its movement through the third unit, giving support directly above both the work piece and the tool, are mounted four non-rotating "catpaws" A-A which give direct support to the boring bar and cutting tool B, through automatic expansion against freshly cut walls of the bore. These supports, sliding down the bore, give rigid support because of their controlled ability to either expand or contract. A separate cylinder controls the catpaws mechanism with operation by solenoid or valve.

It is reported that in 72 recent test measurements, six taken in each bore of an automobile cylinder block for out-of-round and for taper, the greatest error did not exceed 0.0003 in., and that the average error was 0.000175 in.

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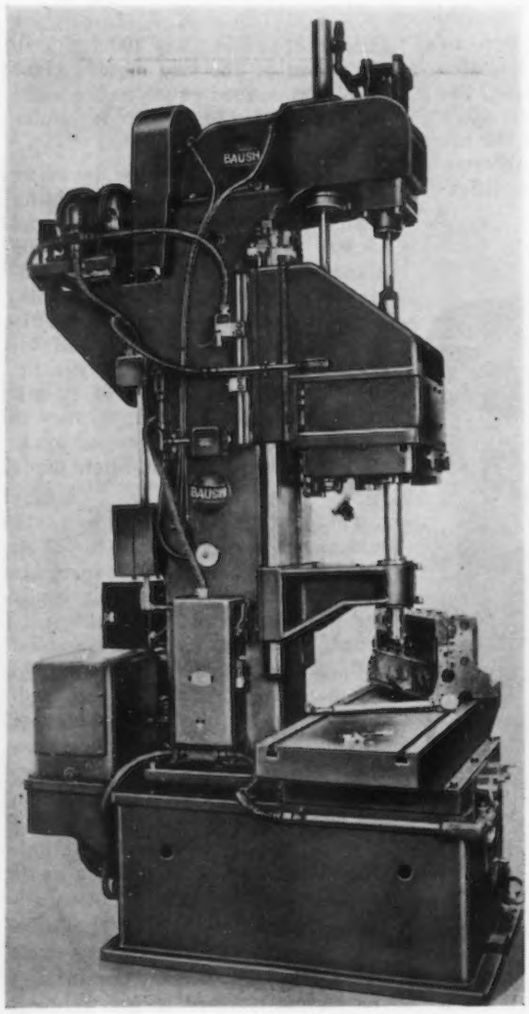
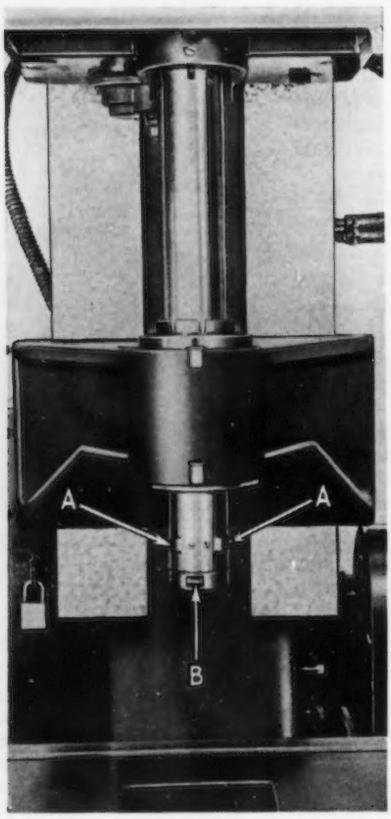


OVER-HEAD, hydraulic, center feed, and featured tool support, are said to have demonstrated extremely close accuracies through the use of this deep-hole boring equipment.



ON AND SHOP EQUIPMENT...

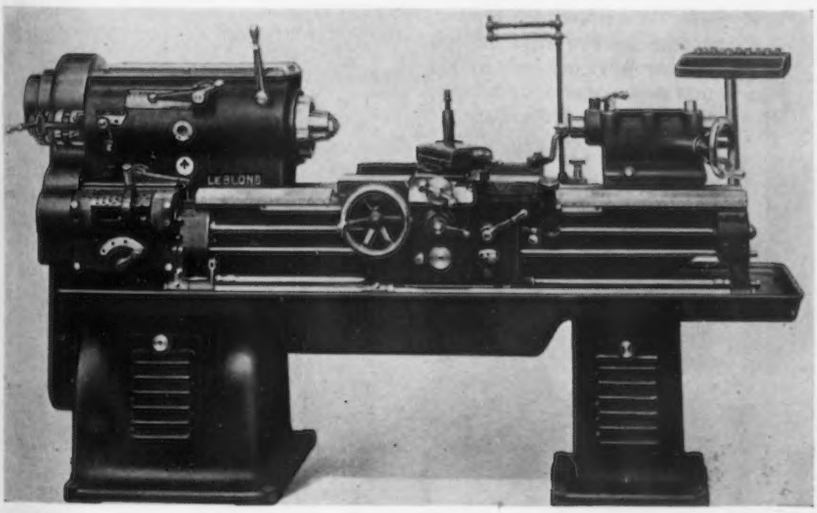
High-Speed Precision Toolroom Lathes

CONVENIENCE in control positions of a minimum number of operating levers is emphasized by the R. K. LeBlond Machine Tool Co., Cincinnati, as an important consideration in a new toolroom lathe here shown. The line is built in 12 and 18 in. sizes and features an extra-deep, braced bed with compensating front-way construction which provides a wide bearing surface. A simplified apron, having double-wall, box-type construction, has one control for both longitudinal and cross movements and control to both spindle and feed reverse.

Tailstock design provides an extra long spindle having full-length bearing even in well-extended position, and angled hand-wheel operation for convenience.

A rugged headstock construction gives spindle support at short intervals, ranging from 12½ in. on the 12-in. lathe to 14½ in. on the 18-in. machine. Spindle mounting is in preloaded zero precision taper roller bearings at the front and center spindle supports, with roller bearing end support to permit sufficient spindle float to compensate for any slight variations resulting from temperature changes in spindle. Headstock gears are hardened chromium nickel steel and have ground teeth. Gears slide on splined shafts and final drive is through a wide helical-face gear. In addition to a gear train for 12-speed changes, the compounding of the feed and the reverse to the feed rod is built in the headstock. Separate drive is provided for leadscrew and feed rod.

The machines utilize a new spindle nose for rapid placement of chucks, face plates and fixtures. This nose was described in THE IRON AGE, July 16. Multi-disk driving clutch and brake is employed. Drive is by multi-V belt. Feed changes are 56 in number, ranging from 0.0013 to 0.166 in. Fifty-six quick changes of thread are from 1½ to 184 threads per inch.

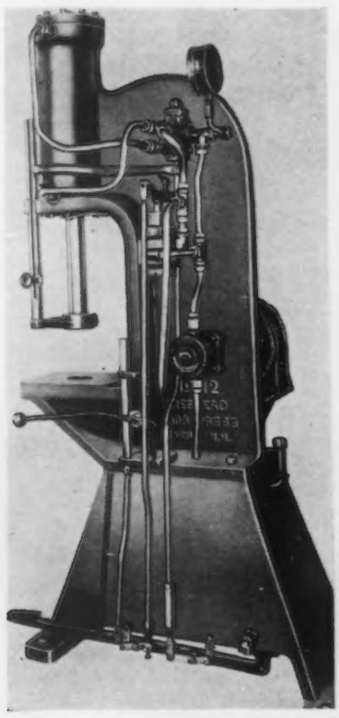


IN a new high-speed precision toolroom lathe, operating convenience and the use of a recent type spindle nose for quick positioning of work are featured.

Hydraulic Press for Ball Bearing Assembly

ONE-HALF to 15-ton pressure on down stroke is provided in a new Greenerd hydraulic press built by Edwin E. Bartlett Co., Nashua, N. H. Design of the No. 60 BB press shown is specifically for assembly of ball bearings, using special fixtures for the work. A special straightening table provides also for straightening operations.

The amount of ram pressure exerted is controlled by the amount of pressure applied to a foot treadle; the amount may be held



RAPID assembly of ball bearings with the hydraulic equipment illustrated is through ram pressure that may be controlled by foot treadle or locked by hand lever.

evenly by treadle or locked by hand lever. Locked pressure will remain indefinitely until the hand lever is tripped to automatically return the ram to power stop which may be set at any predetermined point. Likewise, ram-return may be by release of foot treadle when the hand lock is not used. The tank is positioned in the base and a 3 hp. motor is mounted on the side of the machine. The frame and cylinder are a unit semi-steel casting. The steel piston is assembled with six cast-iron piston rings.

A 12 x 12-in. table, having a 3½-in. cored hole in its center permits of work up to 18 in. diameter. Height over table with ram up is 16 in., with stroke adjustable to this maximum. Speed of the 2 7/16-in. ram, on the down stroke, is 36 in. per min.

Tool Grinder Operated From One Position

IMPROVEMENTS in cutter and tool grinding machines are featured in a new No. 10 machine announced by Brown & Sharpe Mfg. Co., Providence. A heavy single-piece base casting supports a sliding table and wheel spindle column. The sliding table mounts a swivel table and may be traversed by hand at a fast or slow rate of 11/16 in. or 6½ in. per revolution of the handwheel. A graduated arc at the table front reads to degrees and a scale at the end reads to 3-in. taper per ft.

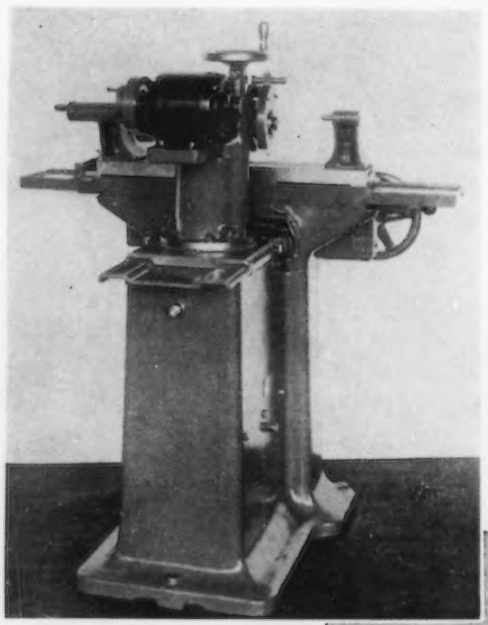
Centerhead and footstock are clamped to the swivel table and drawn securely into alinement by bolts placed at an angle to the table surface. The centerhead is equipped with a clearance setting gage.

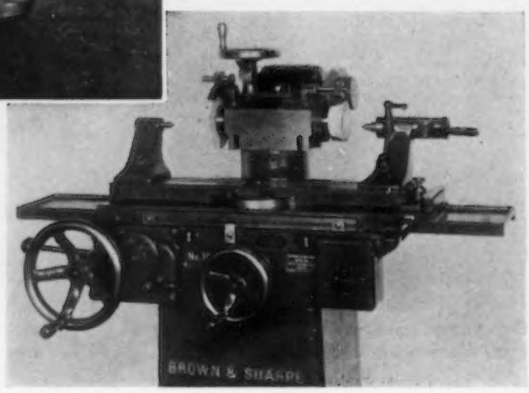
Wheel-spindle column has a transverse movement of 7 in., controlled by a handwheel graduated to read to 0.001 in. It swivels 90 deg. either side of the zero line, the scale reading to degrees. Spring shoes maintain column alinement and a vertical setting clamp is provided. Vertical adjustment to 5½ in. is controlled by handwheel graduated to 0.001 in.

A cartridge-type spindle is driven by V-belt from a constant-speed, dust-proof motor. Spring shoes automatically maintain adjustment of wheel-spindle boxes. Wheel speeds are 3760 and 4380 r.p.m.

A single operating position only is required for all types and sizes of cutters and permits the operator to see grinding wheel in work contact under all conditions. All table and wheel controls are likewise within easy operating reach of this one position.

Machine centers swing 10 in. diameter and take 20 in. in length. Maximum longitudinal table travel is 18 in. by handwheel, and a 4-in. table reciprocation by handlever is available at any point in the 18-in. travel. The largest diameter that can be ground on centers is 6 in. Complete groups of accessories are available for regular work as well as for such occasional jobs as may be presented from time to time.





ADVANTAGES resulting from low fixed height, adaptability for all types of cutters, and one-position operation are emphasized by the makers of this improved toolroom equipment.

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Portable Hydraulic Punch

HANNIFIN MFG. CO., 621-631 South Kolmar Avenue, Chicago, is marketing a new high-speed portable hydraulic punch for semi-automatic handling of a range of punching operations. The unit weighs 59 lb. and has a capacity of 17½ tons. Dies are interchangeable, providing for punching holes up to ⅞ in. in drawn and formed parts of sheet steel up to No. 10 gage. The yoke is provided with shoulders for attachment of an adjustable stripper for automatic removal of shells of various depths. The operating cycle is approximately 2 sec.

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DESIGN of this portable hydraulic punch unit provides non-repeating control of punching operations up to ⅞-in. hole in No. 10 gage steel.

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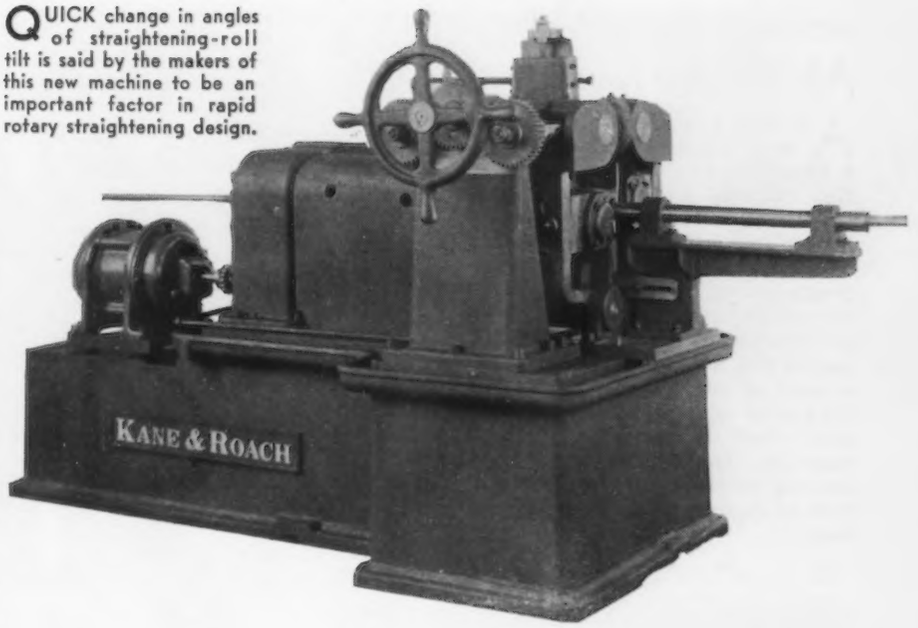
Operation is from a Hannifin "Hy-Power" hydraulic pressure generator consisting of motor driven oil pump, automatic electric valve unit, and oil reservoir. The punch is connected to the pressure generator unit by hoses and electrical control cable. A handle push button controls the entire operation of the unit. When the control button is depressed, the following cycle is automatically completed; rapid advance stroke until the die touches the piece; automatic high pressure to punch the hole; automatic reversal; and rapid return to starting position. The oil pump idles at zero pressure between cycles.

The punch does not repeat. The control button must be released and pressed for each cycle; release at any point during the operating cycle provides an instantaneous safety stop, with automatic return to starting position.

Rotary Straightening Roll

QUICK change in angles of straightening-roll tilt is said by the makers of this new machine to be an important factor in rapid rotary straightening design.



A NO. 2 rotary straightening roll, by Kane & Roach, Inc., Syracuse, N. Y., consists of two power-driven straightening rolls carried in Timken anti-friction bearings, and provided with suitable seals for protecting from scale, dust and foreign matter.

Design permits quick change of the angle of tilt of the straightening rolls, to meet varying conditions. Drive to the straightening rolls is from inclosed oil tight gear box, through the medium of universal joint drive. A helical gear reduction unit is equipped with Timken anti-friction bearings throughout and runs in oil.

Cooling system, complete with rotary pump, piping, valves, etc., is housed in the base which is of box form, suitable for receiving the straightening roll housings, reduction gear unit, and motor.

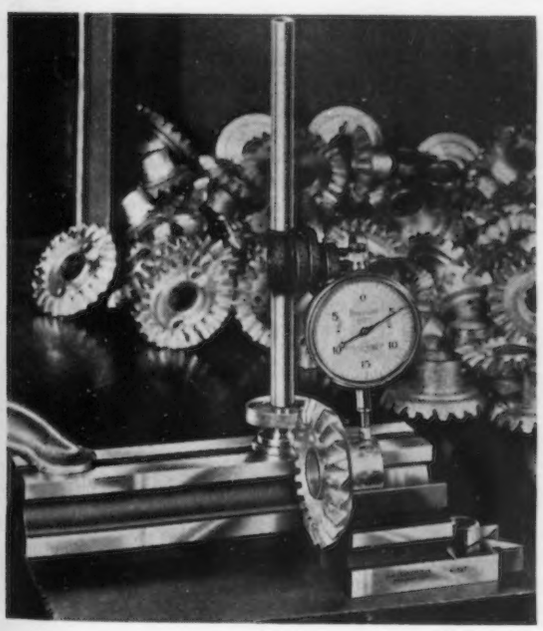
One set of feed and delivery tubes is standard equipment. Production is specified as 50 to 75 ft. per min. depending upon the speed at which the stock reacts best. Capacity is mild steel rounds ¼ to ¾ in., heat treated steel rounds ¼ to ⅝ in., and tubing 1⅛ in.

Production Inspection Equipment

TWO new tools by the L. S. Starrett Co., Athol, Mass., may be used separately for unit operations or in combination for production inspection of a wide variety of duplicate parts. They are designated as the No. 665 dial test indicator and No. 567 V block and clamp. The set-up illustrates checking the hub diameter of bevel gears.

The dial test indicator is furnished with a right angle arm for further adjustment beyond that obtained with the horizontal arm. Either arm can be removed from the standard and used in the tool post of a lathe. Small blocks which fit into the base provide a guide for checking against the edge of a T-slot or work plate.

The V-block is of steel, hardened and ground. The sides are ground parallel and the V-grooves are ground central and parallel to the sides and base. One end of the block is stepped down and has a groove at right angles to the base in which shouldered studs, round pins and similar pieces may be clamped for light milling, drilling and grinding. Hole clearance is provided for drilling and removing dowel pins. Four ⅜ in. tapped holes, two in the base and one in each side, facilitate attaching the block to face plates or angle irons in a number of ways. Capacity of the block is approximately 1 5/16 in.



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THESE inspection instruments may be employed separately or used in combination in the rapid checking of duplicate parts.

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THE element of resiliency is said to be inherent in this steel skid platform because of corner construction.

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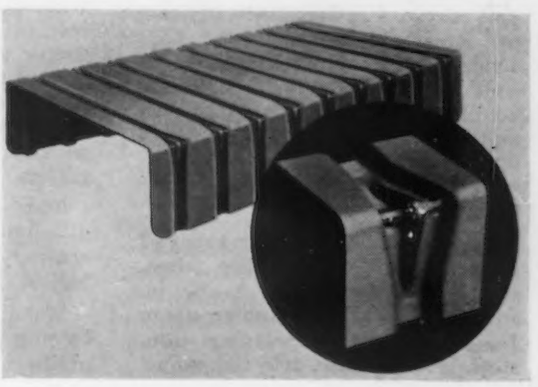
Steel Skid Platforms

ALL-STEEL, lift-truck platforms, announced by the Youngstown Pressed Steel Co., Warren, Ohio, present a corner construction of integral, twin-ribbing said to provide both stability and resiliency as important platform features.



Inclinable Press With All-Welded Frame

AN inclinable press, here shown, built by the Cleveland Punch & Shear Works Co., Cleveland, size No. 11, has an all-welded steel frame made up of box-section housings, giving bed area of 29 in. front to back, by 40 in. right to left. Single geared mechanism, arranged for direct-connected motor drive provides a capacity of approximately 115 tons, with operation at a speed of 40 strokes per min. A block-type clutch is used. The drive shaft is mounted in roller bearings. The slide has extra long bearing surfaces and is provided with an improved two-piece connection.

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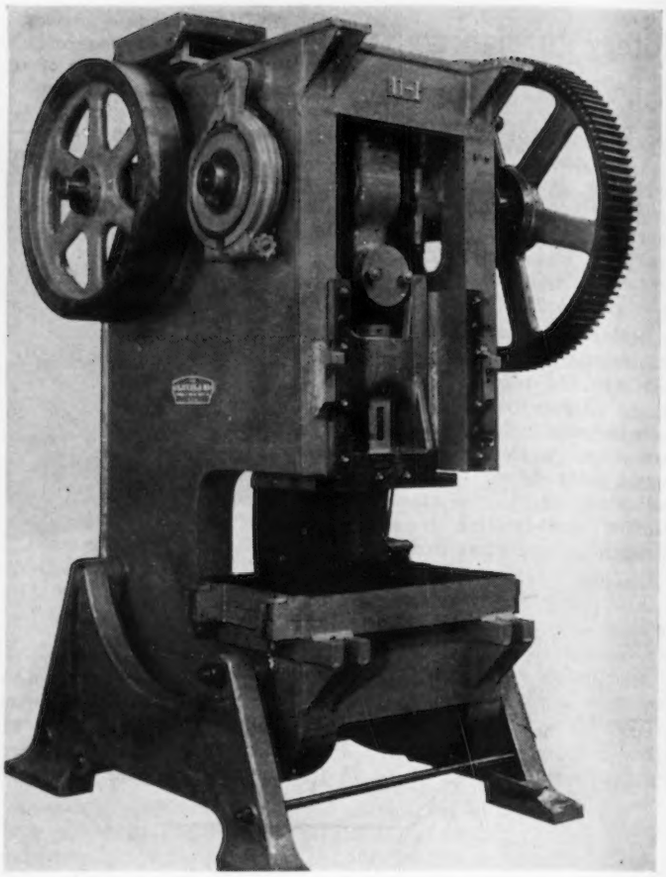

ABOVE

APPROXIMATELY 115 tons capacity, at 40 strokes per min., is specified for this new inclinable press.

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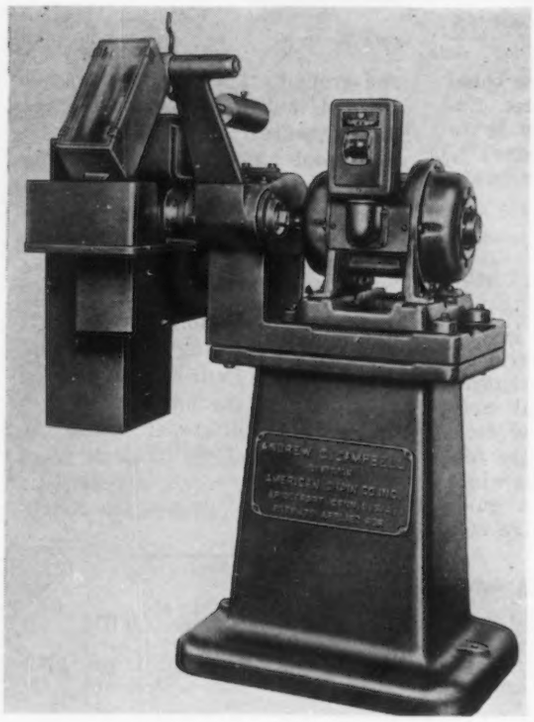

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THIS abrasive cut-off machine features utility for miscellaneous tool-crib work.

Tool Crib Abrasive Cut-Off Machine

A NO. 0 tool crib cutter by Andrew C. Campbell Division of American Chain Co., Inc., Bridgeport, Conn., provides a small unit for the tool crib in that it is adaptable to handling the hundred and one cutting jobs that come up during every working day. Adaptability covers light jobs of production cutting as well.

Capacity includes many types of materials of the smaller sizes, solid-bar materials up to ⅝ in. square or round, and tubing up to 1¼ in. diameter, including iron, steel, brass, bronze, drill rod, monel metal, high speed steel, porcelain, etc.

Although the machine is of the wet cutting type it can be used for dry cutting. Coolant is provided without the use of a pump as a thin revolving abrasive disk picks up the proper amount of coolant from the coolant tank and distributes it into the area enclosed by the wheel guard where it reaches both the periphery and the sides of the cutting disk.

The cutting disk is mounted on a spindle which is equipped with specially selected, grease-sealed ball bearings.

Mounting is in a rigid semi-steel casting which forms the upper part of the machine. This casting also houses a positive chain drive compartment, entirely separate from the ball bearings. The motor is mounted on a standard sliding base which is used for adjustment of the chain drive.

The coolant tank is located at the left-hand side of the machine, is quickly removable for cleaning and is provided with an adjustable float chamber by which the level of the coolant is regulated; by submerging this float chamber, the level of the coolant rises around the lower edge of the cutting disk to any point desired and the amount of coolant distributed by the revolving disk can be thus closely regulated.

A V-type holder for work material is mounted on an arm which swings from the top of the machine and extends three inches on each side of the disk. The material is placed in this holder with one end against an adjustable stop. The holder is then fed against the cutting disk by hand, while an adjustable stop prevents feeding too far into the disk. The swing frame is provided with an extra heavy glass window.

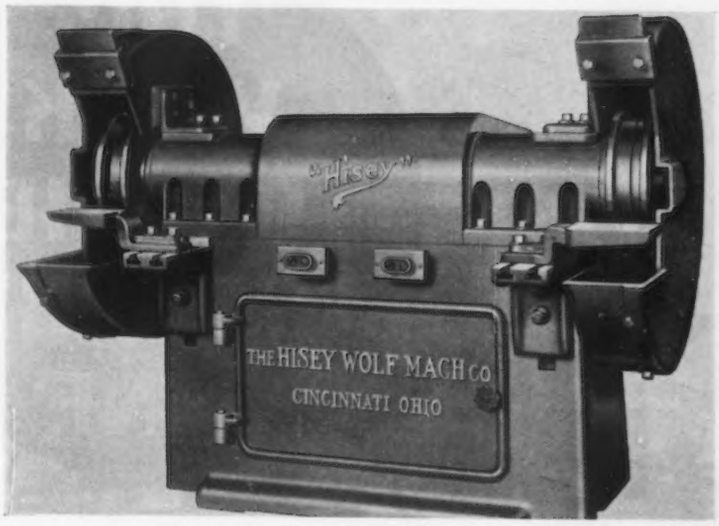
Material holder extensions can be had in multiples of two, four, six and eight feet, for use on either or both sides of the cutting disk. These are carried by an oscillating shaft, which derives its initial mo-

tion from the material holder swing frame adjacent to the cutting disk. When the swing frame is moved, the material holder extension moves in line with it maintaining correct alinement regardless of its length.

Cutting disks are up to 12 in. in diameter, and 1/16 to ⅛ in. thick. Spindle flanges are 4 in. in diameter, permitting an abrasive disk to be worn down to whatever diameter is 4 in. plus twice the size of the material being cut.

Hydraulic Presses for Varied Materials

HIGH-SPEED, heavy-duty hydraulic presses for metal forming, and compressing and dehydrating various materials are being built in a number of capacities by Charles F. Elmes Engineering Works, Chicago. The illustration is of an adjustable high-speed duo drawing press for simultaneous production of different products through individual adjustment of pressure applied on each cushion cylinder.



New Line Heavy-Duty Snagging Grinders

A NEW line of heavy-duty, textdrive, snagging grinders, announced by the Hisey-Wolf Machine Co., Cincinnati, provides that in production snagging, entire assemblies of wheels and flanges may be removed for transfer as an integral unit. A system of wheel transfer in batteries of single-speed grinders provides for transfer of wheels to suitably speeded machines as wheel wear reduces diameters from 30 in. to 24 in. to 20 in. The new line consists of four sizes 5, 7½, 10 and 15 hp. in 15 different types consisting of single spindle grinders, multi-speed grinders and two-spindle grinders with one or more speeds. In the later type, the speed of spindles may be changed independently to suit size of wheel.

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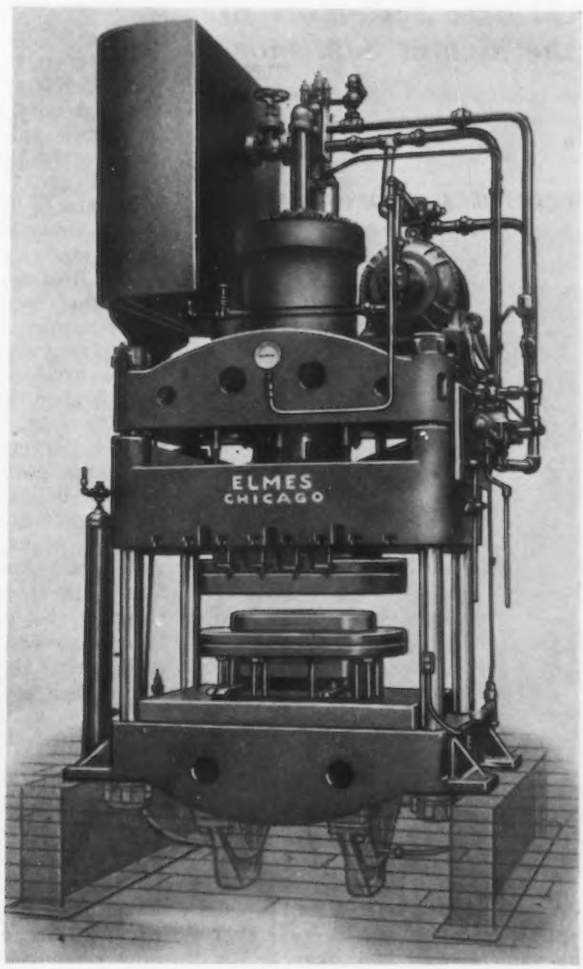
AT RIGHT AND BELOW

INDIVIDUAL adjustment of pressures on cushion cylinder in a duo-press set up illustrated is said to permit of high-speed production in a wide variety of products.



Low-Range Pressure Instruments

THE Bristol Co., Waterbury, Conn., announces a new series, D40M, of low-pressure recording gages and controllers. The instruments are equipped with bell-type measuring elements and are applicable for draft or pressure in minimum ranges of zero to 0.2 in. of water and maximum ranges of zero to 2.0 in. of water. The control instruments operate on the basic free-vane principle of pneumatic control and are equipped with the ampliset sensitivity adjustment for synchronizing throttling range with process lag. Both wall and flush-panel types of mounting are available.

Improved Oiler

IMPROVEMENT in oiling regularity through control of intermittent drip from bottle-type oilers, is announced by Trico Fuse Mfg. Co., Milwaukee. Particular application is for solid wick and waste-packed bearings. The new oiler is manufactured in three sizes and is said to seldom require drilling or tapping of holes for application.

THIS WEEK ON THE ASSEMBLY LINE

. . . Automotive production again advances as Ford Motor Co. swings into line.

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. . . Passenger car and truck sales in September are approximately 33 per cent over September of last year and represent the highest September truck volume on record.

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. . . Nash and Kelvinator directorates approve merger which stockholders must now ratify.

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. . . Chrysler introduces the Chrysler Royal in the low-priced field, very similar in design to the new DeSoto, which sells for $30 less.

DETROIT, Nov. 2.—With automobile companies advancing announcement dates as rapidly as dealers become stocked, automotive production has again taken an upward swing of approximately 7000 units during the past week. Ward's Automotive Reports estimate 71,095 passenger cars and trucks assembled in the United States and Canada for the week ending Oct. 31, as compared with 64,310 for the week before. General Motors stepped up its total production from 31,700 to 33,500, Chevrolet producing 22,500 units of this total, as in the previous week. Chrysler Corp.'s output advanced from 19,000 to 20,700, with Plymouth accounting for 11,000 of this total and operating almost at capacity, which is normally 12,500 units a week. Ford Motor Co., which has experienced a number of delays, is credited with 2500 assemblies last week. A large gathering of Ford dealers is scheduled for Nov. 6, at which time the new models will be presented. Formal announcement of the new car is not expected before Nov. 11, however.

Passenger car sales for September totaled 208,896 units, representing a 33 per cent increase over the same month last year and a drop of 20 per cent from the August, 1936, figure. Truck and commercial car sales, according to R. L. Polk & Co., continued their skyrocketing tendencies during September, when sales totaled 54,611, a gain of 32 per cent over September of last year and the highest September volume in the history of the industry.

In September, 1929, last previous high, 46,560 commercial units were sold. Altogether, passenger car and truck sales exceeded by approximately 125,000 the total production for the month, so that dealer stocks have shrunk considerably. Nevertheless, a preliminary survey made by the National Automobile Dealers' Association indicates that new car stocks are at present approximately 3½ per cent above last year's stocks. Used car stocks are approximately 15 per cent higher. Deliveries of used cars to date, on the other hand, are 34 per cent higher than for the same period last year, while new car deliveries are only 17 per cent higher for the group reporting. It is expected that dealers will again have to carry rather heavy inventories of used cars through the winter months since trade-ins reach their maximum volume during the period of introduction of new models.

Nash-Kelvinator Merger

Directors of the Kelvinator Corp. met at Detroit last week to approve the merger with the Nash Motor Co., which held a directors' meeting at the same time in Kenosha. Both directorates approved this joining of forces. It now remains for the stockholders

to ratify this action, but no opposition is expected. Substantial benefits to both companies are anticipated. The alliance will be of special value to Kelvinator in the extension of its air-conditioning program, which at present is being marketed in the form of the Kelvin Home (THE IRON AGE, Oct. 29, 1936, p. 40). It is even anticipated that these air-conditioning units, which sell for approximately $1200 in the "package" form, will be merchandised through Nash dealers. In any event, there will be a definite amalgamation in sales forces so that consumer preference for either the Kelvinator line or the Nash cars can be capitalized on in selling the other product. Both companies will benefit also from an amalgamation of purchases. This is particularly true of steel, since sheets are used extensively in both refrigerators and in automobiles. Manufacturing problems are not entirely unlike, since the refrigerator compressor is a reciprocating type employing the usual piston, connecting rod and cylinder.

In making this move, Nash and Kelvinator have the example of General Motors and Chrysler to follow. General Motors, as is well known, is already heavily involved in both air-conditioning and electric refrigeration, and Chrysler Corp. has its Airtemp, Inc., at Dayton, Ohio. George W. Mason, president of the Kelvinator Corp., and likely president of Nash-Kelvinator Co., has long been active in the automobile industry, having been works manager for Chrysler plants for four years prior to his getting into the refrigerator industry in 1925. He started in the automotive industry in 1913 at Studebaker and in 1914 he went with Dodge Bros. as assistant to the president in charge of manufacturing at the time of its reorganization. He left Chrysler in 1925 to become president of Copeland Products Co., resigning in 1927 to assume a similar position at Kelvinator, which has made notable progress since that time. Kelvinator is manned with many other former Chrysler officials as well.

Kelvinator has expanded its production facilities in Detroit recently and there is no space available suitable for Nash Motors production. It is very doubtful whether Nash will ever move its operations to Michigan unless it should be forced to do so by the labor situation in Wisconsin. Several times this year there have been labor troubles in Racine, Wis., where Nash has one of its manufacturing divisions. These troubles have occurred mainly in the plants of the J. I. Case Co. and only last week the company closed down

THE new DeSoto hood opens from the front and is hinged at the cowl. Chrysler models feature similar hood treatment. Trim is of 18 per cent chrome steel.

Elected
INDUSTRY'S CHOICE . . .

There have been over a hundred votes cast in the form of orders for the new Pratt & Whitney Jig Borers since they were announced last year in Cleveland. These machines first were introduced to the trade in 1917. Hundreds of them have been purchased during the intervening years, and every one has lived up to its original promise of sustained accuracy and real economy. Pratt & Whitney Jig Borers are being "reelected" frequently by repeat orders.

The new Pratt & Whitney Jig Borers have carried the art of precision boring a long step forward, with many new features which have speeded up production. These include higher spindle speeds, a wider feed range, and many built-in conveniences.

The method of measuring used in the Pratt & Whitney Jig Borer is the fundamental one from which all other systems are derived and calibrated. Each slide is equipped with these basic instruments as illustrated above. The end measures are for even inches, and the inside micrometer for inch fractions (.0001"). The dial indicator is used only as a pressure gage to maintain the "zero point". The instruments can be rechecked individually at any time without dismantling the machine. They provide visible accuracy, and show instantly any error in locating.

Send for our literature on precision boring. There is no obligation.

PRATT & WHITNEY DIV.
Niles-Bement-Pond Co.
HARTFORD . CONN . U. S. A.

three of its Racine plants in retaliation for a sit-down strike that had occurred among members of the newly formed United Automobile Workers' Union.

The New Chryslers

Chrysler sales division of the corporation has entered what it terms the low-priced field by bringing out the Chrysler Royal, selling at a base price of $715 for the business coupe—just $30 more than for the similar models of the DeSoto, which matches the Oldsmobile 6 in price. DeSoto, incidentally, has abandoned the Airflow model this year and will concentrate on a single line which is practically identical in many characteristics with the Chrysler Royal. Both models have a new 6-cylinder "Gold Seal" engine of 228 cu. in. displacement, developing 93 hp. at 3600 r.p.m. It is understood that this engine is also being used for the Dodge truck.

Like the new Plymouth, U-shaped slots are cut in the anodically-treated aluminum pistons to give a better fit in the bore. In this Gold Seal engine the valves are larger and austenitic steel is employed for the exhaust valves because of its higher red-heat strength. A compression ratio of 6.5 to 1 is used and as a result an engine lighter in weight and with better fuel economy has been obtained over its predecessor.

Both the DeSoto and the Chrysler Royal feature hypoid rear axles, independent front wheel suspensions of the coil spring type and direct-acting airplane-type shock absorbers such as were illustrated for the Plymouth in last week's *Assembly Line*. In fact, these features have been carried right through from Plymouth up to the Chrysler Custom Imperial and Airflow, which retain the standard spiral bevel pinion drive. Other Chrysler features that have been carried straight through the line include insulating the bodies from the chassis by rubber spools, recessing all instrument controls in the dash and using seamless steel tops and disk wheels.

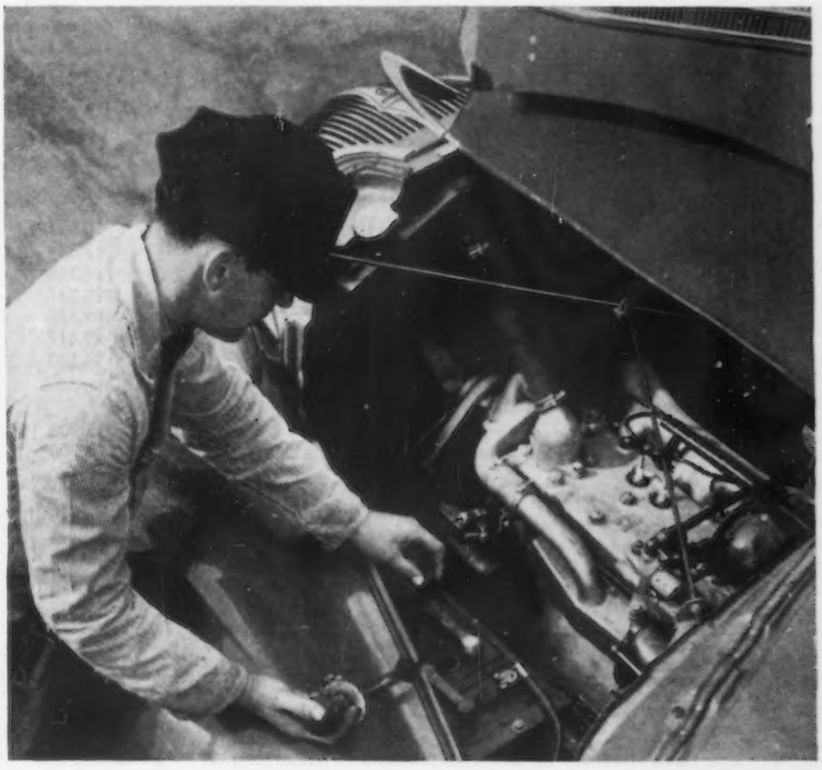
On both the DeSoto and the Chrysler Royal, bodies have been widened so as to give 2½ to 3 in. more seat room inside and the overall length of the car has been increased to 199 in. for each. Both doors and bodies have been strengthened. There is additional strengthening in the cowl by a new type of Z-bar bracing. The center door post made of box sections has been stiffened and given a wider flare at the top. Rear ends have been strengthened and the separate frame of the two rear windows add bracing to the rear panel. New brackets have been added to the extreme rear corners of the body and diagonal braces extend from the rear quarter windows to the rear of the wheel housing.

CHRYSLER enters the low-priced field with a Chrysler Royal which is priced $30 higher than the DeSoto, model for model. Practically all mechanical features are identical.

Tops are one-piece steel extending back from the cowl or luggage compartment opening. The lower edge of the top panel is turned in and a new type of drip molding is spot welded to the flange thus formed. The upper edge of the side panels is turned in and is joined to the top by pinch welding.

In both the Chrysler and the DeSoto, the hood, which is several inches longer than previously, is stamped from a single piece of steel and is hinged from the rear. The former radiator emblem acts as a hood lock control. Trim of this hood is 18 per cent chrome steel, as are the hood louvers and the belt molding which is carried back to the extreme rear of the car. As in most 1937 models, the front fenders have been made

(CONTINUED ON PAGE 82)



NO longer is the storage battery out of sight and out of mind in the new Hudson-built cars.

Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

	September, 1936	August, 1936	September, 1935	Nine Months, 1935	Nine Months, 1936
Raw Materials:					
Lake ore consumption (gross tons)[a]	4,026,690	3,968,845	2,654,278	21,824,386	31,434,081
Coke production (net tons)[b]	3,994,741	3,993,602	2,892,530	25,361,396	33,112,191
Pig Iron:					
Pig iron output—monthly (gross tons)[c]	2,730,293	2,711,721	1,776,476	14,857,025	21,564,508
Pig iron output—daily (gross tons)[c]	91,010	87,475	59,216	54,423	78,703
Castings:					
Malleable castings—production (net tons)[d]	46,552	42,253	36,996	333,053	407,310
Malleable castings—orders (net tons)[d]	44,361	45,179	35,658	317,014	395,626
Steel castings—production (net tons)[d]	.....	81,574	35,411	282,433	.....
Steel castings—orders (net tons)[d]	.....	59,393	29,995	292,361	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons)[c]	4,161,108	4,195,130	2,825,004	24,051,412	33,605,304
Steel ingot production—daily (gross tons)[c]	160,043	161,351	113,000	103,225	143,612
Steel ingot production—per cent of capacity[c]	72.92	73.52	51.04	46.63	65.44
Finished Steel:					
Trackwork shipments (net tons)[c]	5,722	6,401	2,962	32,619	52,931
Steel rail orders (gross tons)[c]	25,800	5,800	7,400	324,557	684,828
Sheet steel sales (net tons)[f]	255,557	207,781	196,423	1,754,861	1,866,297
Sheet steel production (net tons)[f]	213,706	202,456	190,701	1,768,712	1,908,471
Fabricated shape orders (net tons)[g]	112,594	101,711*	90,161	777,967	1,162,791
Fabricated shape shipments (net tons)[g]	137,008	135,738*	97,667	825,812	1,100,483
Fabricated plate orders (net tons)[d]	34,302	31,999*	31,105	173,085	356,107
Reinforcing bar awards (net tons)[c]	18,755	33,770	109,835	245,975	274,365
U. S. Steel Corp. shipments (tons)[h]	961,803	923,707	614,933	5,341,223	7,867,707
Ohio River steel shipments (net tons)[i]	95,705	113,560	92,898	671,511	785,381
Fabricated Products:					
Automobile production, U. S. and Canada[k]	135,130	275,951	95,127	3,066,040	3,336,296
Construction contracts, 37 Eastern States[l]	$234,270,500	$275,281,400	$167,376,200	$1,191,697,700	$2,041,627,200
Steel barrel shipments (number)[d]	787,380	588,660	622,187	4,811,793	5,974,024
Steel furniture shipments (dollars)[d]	$1,549,808	$1,438,611	$1,361,449	$10,811,995	$13,710,553
Steel boiler orders (sq. ft.)[d]	.....	1,074,597	575,031	4,311,651	.....
Locomotive orders (number)[m]	24	3	7	28	158
Freight car orders (number)[m]	3,100	3,225	110	7,293	37,348
Machine tool index[n]	118.5	127.5	80.0	†108.5	†132.0
Foundry equipment index[o]	161.0	145.4	128.5	†111.8	†155.3
Foreign Trade:					
Total iron and steel imports (gross tons)[p]	.....	60,697	53,158	299,255	.....
Imports of pig iron (gross tons)[p]	.....	12,524	14,357	81,930	.....
Imports of all rolled steel (gross tons)[p]	.....	28,216	22,970	152,318	.....
Total iron and steel exports (gross tons)[p]	.....	295,341	244,419	2,384,467	.....
Exports of all rolled steel (gross tons)[p]	.....	89,128	65,199	642,903	.....
Exports of finished steel (gross tons)[p]	.....	79,617	58,565	556,553	.....
Exports of scrap (gross tons)[p]	.....	194,600	170,486	1,651,618	.....
British Production:					
British pig iron production (gross tons)[r]	650,800	635,800	529,600	4,793,300	5,696,800
British steel ingot production (gross tons)[r]	1,027,000	872,700	855,900	7,220,300	8,618,000
Non-Ferrous Metals:					
Lead production (net tons)[s]	32,982	33,542	34,998	296,757	330,115
Lead shipments (net tons)[s]	50,685	46,388	37,615	305,817	350,546
Zinc production (net tons)[t]	42,283	43,614	36,221	316,764	395,182
Zinc shipments (net tons)[t]	51,847	46,085	42,351	328,453	392,310
Deliveries of tin (gross tons)[v]	6,200	5,385	5,360	44,360	55,725

†Three months' average. *Revised.

Source of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corp.; [i] United States Engineer, Pittsburgh; [k] When preliminary, from Automobile Manufacturers Association — Final figures from Bureau of Census; [l] F. W. Dodge Corp.; [m] *Railway Age;* [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.

Weekly Index of Rate Activity in Capital Goods, Adjusted for Seasonal Variation, 1925-27 Average = 100

THE IRON AGE Weekly Index Numbers of Capital Goods Activity

(1925-'27 Average = 100)

Last week	84.2	Same week 1933	42.3
Preceding week	83.6	Same week 1932	34.1
Same week last month	77.7	Same week 1931	49.1
Same week 1935	68.6	Same week 1930	75.4
Same week 1934	41.0	Same week 1929	115.3

PRODUCTIVE operations in the durable goods industries were a shade stronger last week, and THE IRON AGE'S barometer of these conditions moved up to 84.2 per cent of the 1925-27 average or "normal." The week before it had been at 83.6, approximately half a point lower. While there occurred no noticeable increase in the rate of steel mill operations last week, the index of this activity rose after seasonal adjustment because normally there should be a tapering off at this time. On the other hand, the index of automobile production remained unchanged after seasonal correction because the rise in the week's assemblies of roughly 7000 units was equivalent to the usual seasonal pick up felt at this time.

Shipments of lumber were greater and there was an appreciable gain in heavy engineering construction work. With steel production off in the Pittsburgh district, that industrial index declined. The rise in aggregate activity, revealed by upward movement of the combined index, takes into account the fact that while one of its factors lost ground and another was unchanged, the three remaining series all showed improvement. The combined index thus reflects considerable strength generally. At 84.2 per cent, it is more than 6 points under the August peak of 90.8 but contrasts with a figure of 68.6 for the same week last year and 41.0 for the same week in 1934.

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Reports, Inc.; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from *Engineering News-Record*.

Mercer Tube Plant Shut Down By Strike

Operations at the Mercer Tube & Mfg. Co.'s plant at Sharon, Pa., were suspended late last week following a strike called by the Amalgamated Association of Iron, Steel and Tin Workers.

The shutdown, ordered when Mercer Tube officials refused to rehire two men dismissed on "grounds of coercion and intimidation" of other employees, leaves 234 workers idle.

A statement by the company said the strike followed a wage adjustment granting increases of 30 to 36 per cent through the introduction of a piece-work and bonus system. A total of 178 out of 234 employees, according to the management, have signed a petition asking that the plant be reopened. The petition read, "We are perfectly willing to return to work under present conditions."

Demands of the strike committee which ask for recognition of the Amalgamated, full seniority rights, 40-hr. work week, 10 per cent advance in wages (now averaging 55c. per hr.) and the reinstatement of the two men discharged have not been answered by Mercer company officials.

WASHINGTON. . . . . .

. . . *Social security issue boils to the surface with employers emphatically denying alleged misrepresentation.*

o o o

. . . *CIO and SWOC will go into a huddle on Sunday and Monday to lay plans for a more intensive organization drive.*

o o o

. . . *PWA claims to have primed pump—total steel purchases, however, were only ten per cent of the total domestic sales.*

o o o

By L. W. MOFFETT
Resident Washington Editor, The Iron Age

o o o

WASHINGTON, Nov. 3.—John Q. Public today is exercising his right of suffrage in the most important presidential election since the Civil War, and, likewise, the most important congressional election since then. By the time this issue of THE IRON AGE is in the hands of readers the die will have been cast, though no doubt the shouting and the din will be present as a hangover. There will be at least surcease from an intense and bitter campaign. Advance registrations indicate a record vote, a vote pertaining to both simple and highly intricate issues. Even under the most favorable circumstances it would be difficult for voters to understand some of the issues, but they were faced with confusion by reason of a tremendous amount of faisity, demagoguery, cant and passion that poured forth in vast volume from spellbinders on the hustings. Truth and logic often had hard going, making more difficult the separation of the wheat from the chaff.

There were pretensions made to placate business and industry, and without in any way attempting to specify who they are the country was assured that there are only a few bad boys in business—just a small minority. Yet there were wholesale broadsides against business, and in these broadsides the "economic royalists" were made to appear as being decidedly numerous. It was class appeal of the worst sort, it was politics of the darkest shade, and demagoguery was given full sway. Examples are numerous. For instance an outstanding example was the refusal of the Senate Campaign Expenditures Committee to act on charges that WPA workers in Pennsylvania were subjected to political pressure while at the same time accepting for investigation the charges that steel and other employers coerced their employees.

The simple denial of WPA directors of charges leveled against them was enough for the Lonergan committee—it whitewashed them. However, this denial has not suppressed the belief that the charges were well-founded. On the other hand, emphatic denial of employers of charges made against them and a complete absence of proof of the charges were scorned—the committee action was so utterly inconsistent and unfair that it is seriously doubted that its obvious purpose was achieved. For that matter it is conceivable that the contrary is true.

Social Security Statements Under Fire

The same may be said with regard to the rage over the Social Security issue. Senator LaFollette announced last Thursday that his so-called Civil Liberties Committee will make a study of alleged misrepresentations by employers of the Social Security Act. Those employers who posted placards in their plants saying that beginning Jan. 1 they will be compelled by law to deduct from the pay envelopes of workers obviously stated the truth as also was the statement that during the year 1937 the employers will have to contribute $3 for every $1 taken from pay envelopes. Some employers gave more details on the act, setting forth other ratios of payments by employers and employees. It is an extremely complicated act, one that is bound to call for revision, and to expect employers to explain it in clear detail was over-shooting the mark. The law is on the books and employees have as ready access to it as do employers. If proof can be cited of instances of misleading information as to payments for the old age and unemployment funds, then Federal action is justified. But what is to be said of the other side of the case. What is to be said of the claim that the act, a compulsory law, is like life insurance, which certainly is voluntary on the part of policyholders? Much better in returns than are those from the Social Security Act, a life insurance company assuredly is required to pay its policyholders the sum due them upon the payment of premiums. Actually the Social Security Act does not say, as has been stated, that "premiums" paid under it are held by the Federal Treasury solely for the benefit of workers. It is hardly conceivable that the funds will not be so used, but it would be a good idea to in-

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sert a provision in the law requiring that they must be so used. As the law now stands Congress actually is not compelled to, but, of course, is supposed to make annual appropriations out of the general fund to pay unemployment and old age benefits. Worthy as is the principle of social security, the fact remains the payments to be made will be inadequate to care for the unemployed and the aged. European experience confirms this statement. If a better system can be worked out in this country without being unduly burdensome to either employee or employer it ought to be adopted. However, the task is a big one and should be shorn of propaganda of any sort.

Steel Unionization Drive Will be Intensified

In the field of labor, it is indicated that the steel and other "mass" industries are about to face a renewed "drive" by John L. Lewis's Committee for Industrial Organization. The pre-election "breathing spell" efforts at organization apparently are about over. Field directors of the steel organizing campaign will hold a huddle in Pittsburgh with the Steel Workers' Organizing Committee on Nov. 7 and 8—the dates having been moved forward from previously announced dates of Nov. 9 and 10, according to an announcement by John Brophy, CIO director. The field directors, together with all those in charge of sub-district offices, so the announcement said, "will be called in for a conference at which they will report on the progress of the campaign."

Meanwhile propaganda being launched by CIO organizers may be so widespread that some of it does not meet with sufficient challenge. But smashing answer is being made by some steel companies to misleading information being spread among steel workers by the organizers. An example of intelligent service in this direction is the use of newspaper space and pamphlets to reply to steel organizers' propaganda. Particularly illustrative is the liberal use of such space and pamphlets by the Lukens Steel Co., Coatesville, Pa. This progressive 126-year-old institution which literally has grown up with the country employs a particularly effective means of attacking propaganda—it uses factual material, which is addressed to Lukens employees and their families.

Debunking Union Propaganda

One of its recent pamphlets is entitled "Let's Debunk the Propaganda." It is an answer to a SWOC circular distributed among Lukens employees, which accurately said that a Lukens statement filed with the Securities and Exchange Commission showed that the company made $1,076,189.27 gross profits in 1935. But then the circular by resort to a ridiculous calculation said, among numerous other misleading statements, that "Those records show that they employ 1812 steel producing employees, or every steel producing employee produced $597 gross profit for the company." The purpose was to make the employees think each had produced a profit of $597 for the company and that therefore they were not getting their share of this money in the form of wages. The calculation is so crude and absurd that it is strange it should be engaged in. The answer, of course, is that when expenses are taken from the gross profits, the Lukens statement shows that in 1935 the company suffered a net loss of $307,728.85. Out of every $1 the company received, 34c. was paid out in payroll and the rest went for expenses, which the pamphlet lists down to the last penny. It's a good job of debunking. Publicity of this sort has been all too rare in the past, and its current use is both wholesome and constructively significant.

And with the close of the political campaign it is to be hoped there will be an end to such ballyhoo as that coming from the PWA which assumes undeserved credit as a "pump primer." A recent instance of this was its statement designed to show what a great stimulus it has been in the direction of industrial activity. Among other things it has been pointed out that PWA expenditures for "iron and steel and their products" during the three-year period ended June, 1936, aggregated $336,000,000. The fact is that this sum represents less than 10 per cent of the total sales by the iron and steel industry during that period.

During the three-year period ended June 30, 1936, the iron and steel industry produced for sale something more than 62,000,000 tons of finished products. It is probable that an average billing price was closer to $60 than to $50 per ton.

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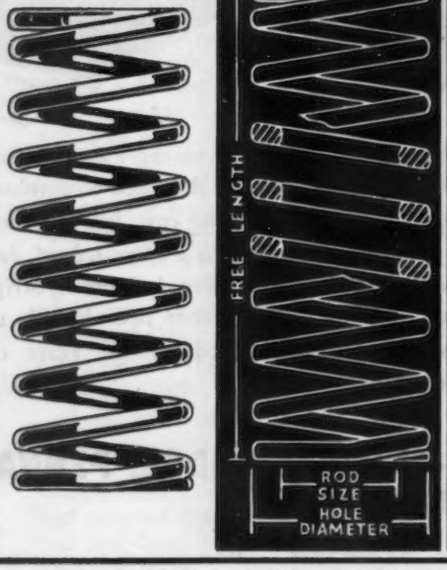

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OFFICE AND FACTORY: LOGANSPORT, INDIANA

Commission Cracks Down on 34 Companies

WASHINGTON, Nov. 3.—Charged with fixing and maintaining "enhanced uniform prices," the Federal Trade Commission has issued a complaint against 34 corporations and their officers, said to constitute substantially all of the country's manufacturers of water gate valves, hydrants, fittings and similar products used for water supply systems. The corporations are members of the water works valve and hydrant group of the Valve and Fittings Institute, New York, which, with its governing committee and its officers, George V. Denny, president commissioner, and Sam G. Moyers, assistant secretary, also is named as respondent.

Selling chiefly to municipalities and to divisions and institutions of State and Federal governments, the complaint said the respondents allegedly engage in price fixing practices "which prevent competition and restrain trade, increase prices and create in themselves a monopoly in the sale and resale of their products.

Prior to 1933, the respondents were engaged in competition among themselves, but in December of that year, the complaint alleges, they entered into a price-fixing combination. For the purpose of making the alleged combination effective, and pursuant to the alleged agreement, it is charged that the respondents have divided the United States into zones "in which they fix and maintain uniform discounts and enhanced uniform prices, and to have established the prices at which jobbers and distributers buying their products must resell them. It is also charged that Messrs. Denny and Moyers "by intimidation and persuasion induced certain of the other respondents to raise their prices and enhanced uniform prices under the agreement."

The respondents have been given until Dec. 4 to reply to the charges and show cause why a cease and desist order should not be issued against them.

The respondents are: American Foundry & Mfg. Co., St. Louis; Bourbon Copper & Brass Works, Cincinnati; Cambridge Machine & Tool Co., Cambridge, Mass.; Chapman Valve Mfg. Co., Indian Orchard, Mass.; Columbian Iron Works, Chattanooga, Tenn.; Crane Co., Chicago; Darling Valve & Mfg. Co., Williamsport, Pa.; Eddy Valve Mfg. Co., Troy, N. Y.; Fairbanks Co., New York; Filer & Stowell Co., Milwaukee; Iowa Valve Co., Oskaloosa, Iowa; Jenkins Bros., Bridgeport, Conn.; Johnson City Foundry & Machine Co., Inc., Johnson City, Tenn.; Kennedy Valve Mfg. Co., Elmira, N. Y.; Ludlow Valve Mfg. Co., Troy, N. Y.; M. & H. Valve & Fittings Co., Anniston, Ala.; Manistee Iron Works, Manistee, Mich.; Michigan Valve & Foundry Co., Detroit; Ohio Injector Co., Wadsworth, Ohio; Pacific States Cast Iron Pipe Co., Provo, Utah; Pittsburgh Valve & Fittings Co., Philadelphia; Reading-Pratt & Cady Co., Bridgeport, Conn.; Rensselaer Valve Co., Troy, N. Y.; Rich Mfg. Co., Ltd., Los Angeles; A. P. Smith Mfg. Co., East Orange, N. J.; South Park Foundry & Machine Co., St. Paul; Traverse City Iron Works, Tra-

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verse City, Mich.; Walworth Co., New York; Waterous Co., St. Paul, Western Gas Construction Co., Ft. Wayne, Ind.; R. D. Wood Co., Philadelphia; W. E. Malpass and Mrs. Frank Bretz, trading as East Jordan Iron Works, East Jordan, Mich.; J. Roy Tanner, receiver for Pittsburgh Valve Foundry & Construction Co., Pittsburgh; and H. M. Kessler, trustee in bankruptcy for Vogt Brothers Mfg. Co., Louisville, Ky.

The Rundel Spence Co., Milwaukee, a subsidiary of Crane Co., and engaged as a jobber and distributor, is named as a respondent but is not a member of the water works valve and hydrant group.

Labor Board Rules Against Crucible

THE National Labor Relations Board has ordered the Crucible Steel Co. of America to end what the board calls the company's interference with the Strip Steel and Wire Workers' Union, an A. F. of L. affiliate, which has been organized at the company's Spaulding and Jennings plant, Jersey City, N. J. The board also ordered reinstatement with back pay of Alva Kocher and John Lutz who, the board said, were discharged Dec. 6, 1935, one week after their respective elections as president and sergeant at arms of local 20084 of the union.

Departing from past practice of confining its orders to issues involved in the cases itself, the board in the Crucible Steel case has issued Bulletin No. 1, entitled "Governmental Protection of Labor's Right to Organize." It presents what is called economic material pertaining to the legal issue of the board's jurisdiction in the Crucible case. Going into a wide field heretofore not invaded by the board, the bulletin discusses integration of the steel industry, as the board sees it. The so-called study is based on testimony in the Crucible and the Jones & Laughlin Steel Corp. cases. The discussion appears to justify any action of labor on the basis that strikes disrupt operations. It states that "there was the great steel strike of 1919 in which it is said more than 360,000 employees went on strike because the steel companies refused to meet any union representatives whatsoever for the purpose of collective bargaining." In 1934, so the board said, 9844 men suffered a loss of 264,810 man-days of work.

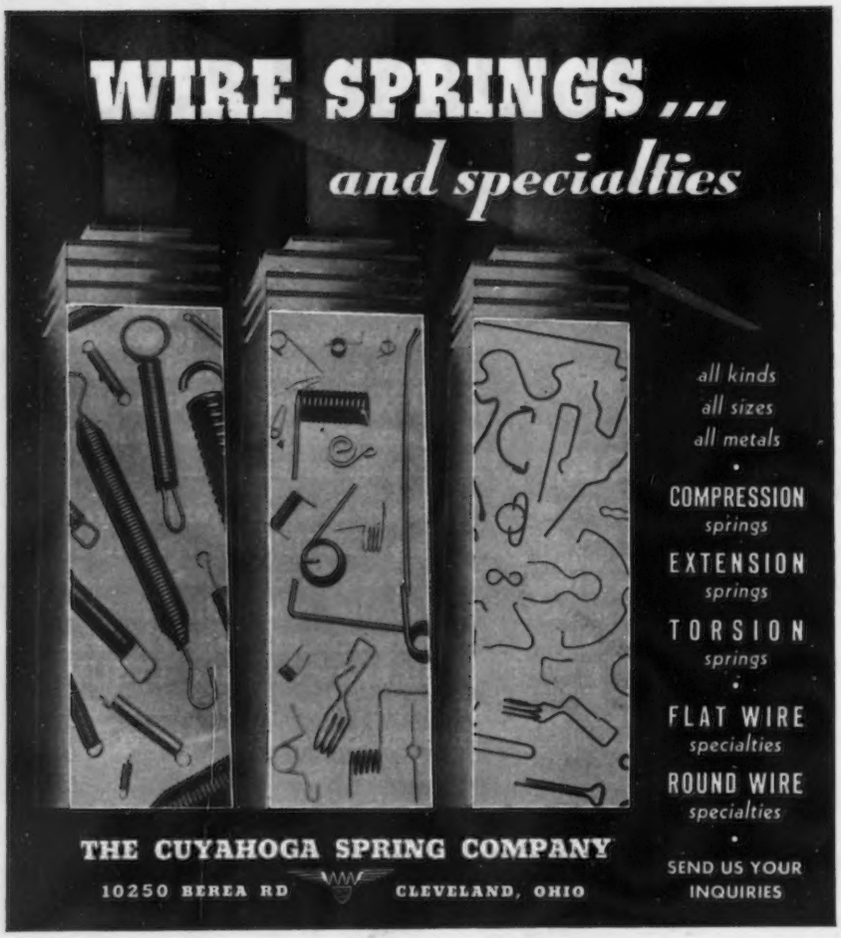
The 1919 strike, of course, was inspired by W. Z. Foster, an avowed radical, member of what was then known as the I.W.W. That strike did not involve anything like the number of men the board report indicates. Nevertheless it reached sufficient proportions to seriously frighten the late Samuel Gompers who was gravely concerned lest Foster's agitators would take over organized labor. And while Gompers temporarily gave unwilling support to the movement no one was more greatly pleased than he when the strike collapsed.

Hoover Cleaners to Utilize Dowmetal

THE Hoover Co. has recently announced that Dowmetal, a magnesium alloy rated one-third lighter than aluminum, will be used in a newly developed vacuum cleaner, following five years of experiments by Hoover and Dow Chemical Co. engineers, and the solution of die-casting problems that have hitherto handicapped broad commercial applications.

New equipment and machinery to handle the metal have been installed at the Hoover plant at North Canton, Ohio, and the company is said to be turning out 5000 castings daily. It is understood that extreme lightness will be one of the main sales points of the new cleaners. The factory production schedule for the first year involves a saving in product weight of 300,000 lb.

National Steel Corp. reports net earnings for the quarter ended Sept. 30, 1936, of $3,359,704.57, equal to $1.56 per share on 2,157,177 outstanding shares of capital stock. This is after all charges except that no provision has been made for Federal tax on undistributed earnings. The net for this quarter compares with earnings in the same quarter of 1935 of $2,287,763.49, equal to $1.06 per share. In the first quarter of 1936, National Steel Corp. earned $2,377,144.69, equal to $1.10 per share, and in the second quarter, $2,805,570.10, equal to $1.30 per share.



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Tin Plate Workers Earn More, Work More

THE average weekly earnings of wage earners in tin plate mills increased from $17.84 in 1933 to $28.09 in 1935, according to a recent survey (No. R430) of the United States Department of Labor. The report also states that average weekly individual earnings in March, 1935, were $20.98 in skelp mills, $19.70 in lap-weld mills, $19.43 in butt-weld mills and $22.14 in seamless tube mills.

The average hourly earnings of tin plate mill wage earners amounted to 73.8c. in 1935. This figure represents an increase of 40 per cent over the 1933 average of 52.7c., thus reflecting the increases in wage rates (according to the report) under the code. Every class of labor benefited from this upward swing in wages. The occupational averages in 1933 ranged from 33.5c. for common laborers to $1.197 for the skilled occupation of rollers. In 1935, the averages for the same occupations were 45.4c. and $1.585 respectively.

The report lists the average weekly hours and earnings of wage earners in tin plate mills by occupation (31 classifications) for 1933 and 1935. The same procedure is followed to break down the characteristic earnings of workers in strip mills, skelp mills, and lap-weld, butt-weld and seamless tube mills.

Committee Reports on Sheet Distribution

IN a report before the recent meeting of the National Association of Sheet Metal Distributors in Atlantic City, F J. McNeive, of W. F. Potts, Son & Co., Inc., Philadelphia, stated that replies to a questionnaire sent out by the committee on distribution of flat and corrugated sheets indicated that there had been no noticeable increase in direct mill shipments because of the establishment of quantity and item extras, and that the present $2 per ton differential should be continued. He also found that galvanized seconds are not being distributed to any extent in the territories of those questioned, and that the present differentials on galvanized roofing sheets of $4 per ton on 26-gage and lighter and $2 per ton on 24-gage and heavier are satisfactory.

On the question as to whether mills were restricting the application of the present differential to bona fide distributors in the respective territories, 26 of those polled answered affirmatively, while 14 replied in the negative. On the subject of black sheets, 26 thought the present schedule of items and quantity extras was beneficial, while nine disagreed.

Although there was some discussion, more than 80 per cent of the members were in favor of the continuance of the present galvanized flat and roofing sheets differentials.

Workers Reject Amalgamated Union

AT a recent election, held under the terms of an agreement which two weeks ago ended a two months' strike, employees of the Standard Steel Spring Co., Coraopolis, Pa., chose the employee representation plan as their collective bargaining agency by a better than two to one margin over the Amalgamated Association of Iron, Steel and Tin Workers.

The election was held under the supervision of the sheriff's office and the vote was 433 for the plant union against 193 for the Amalgamated. It was the latter group which precipitated a strike at the company's two plants some time ago and the Amalgamated had the support of the Steel Workers' Organizing Committee.

Following a policy begun last year of devoting a series of issues to certain basic industries, the steel industry is being featured in the current number of *The Texaco Star*, official publication of the Texas Co., 135 East 42nd Street, New York. The issue, which is being distributed to 100,000 stockholders and employees throughout the world, is profusely illustrated with interesting and attractive photographs, and deals with the historical background and present importance of the steel industry in the United States.

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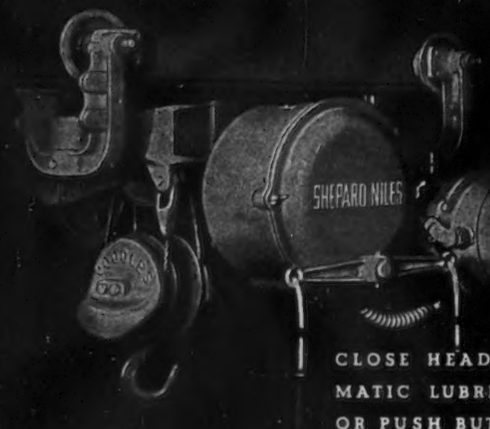

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...OBITUARY...

JAMES A. HALL, professor of mechanical engineering at Brown University, died in that city after a long illness, on Oct. 29, aged 48 years. He was graduated from Brown in 1910, when he first joined the faculty. He had been consulting engineer for the Brown & Sharpe Mfg. Co. for the past 10 years. He was a member of a number of professional societies including the American Society of Mechanical Engineers and the American Association for the Advancement of Science.

❖ ❖ ❖

JAMES D. WIGGLESWORTH, who had been associated with the Hill-Clarke Machinery Co., Chicago, since 1922, died at the Evanston Hospital on Oct. 26, aged 36 years.

❖ ❖ ❖

T. J. BROWN, formerly superintendent of the rail and merchant mills of the Colorado Fuel & Iron Co., Pueblo, Colo., died of pneumonia in this city on Oct. 18, aged 78 years. He had been identified with the company for 35 years when he retired in 1924.

❖ ❖ ❖

EDWIN D. HAGUE, sales manager of the Whitman Machine Works, died at his home in Brookline, Mass., on Oct. 25, aged 55 years.

❖ ❖ ❖

CHARLES G. JURACK, founder and resident-treasurer of the Charles Jurak Co., Milwaukee, one of the largest and oldest foundry pattern manufacturing concerns in the Central West, died on Oct. 22, aged 78 years. Born in Germany, he came to America in 1882, going directly to Milwaukee, where he started a small pattern shop. In later years his eldest son, Charles, Jr., became vice-president, and his second son, Paul, became secretary of the corporation.

❖ ❖ ❖

AUGUST L. KAEMS, formerly president and since early in 1936 vice-president of the Jambor Tool & Stamping Co., Milwaukee, and nationally known as an industrial safety expert, died of heart disease on Oct. 23 while returning from a business trip to Moline, Rock Island and Davenport. He was born in Manitowoc, Wis., in 1862. From 1902 to 1918 he was a member of the Industrial Commission of Wisconsin, resigning to become head of the safety division of Simmons Co., Kenosha, Wis., then becoming head of the Jambor organization. Meanwhile he invented numerous machine guards, including the standard punch press guard of the present day. He served on the National Safety Council for 18 years.

❖ ❖ ❖

HARRY FLINT HUFF, manager of the extruded metals and die press department of the American Brass Co., at Kenosha, Wis., until illness necessitated his retirement a year ago, died on Oct. 24. Born in Flint, Mich., 46 years ago, he went to Kenosha with his parents when five years of age and entered the employ of the brass concern shortly after being graduated from high school.

New lists of names of iron, steel and building material importers and dealers in Chile, Guatemala, Honduras, Panama and Venezuela have recently been compiled by the Department of Commerce, Washington. Copies may be obtained for 10c. each.

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..PERSONALS..

E. F. ENTWISLE, assistant general manager of the Lackawanna plant of the Bethlehem Steel Co., has been appointed general manager at that plant. He has been in active charge of operations since TIMOTHY BURNS, general manager, was taken ill last spring. Mr. Burns will continue to be connected with Bethlehem in an advisory and consulting capacity. Mr. Entwisle entered the employ of the company as a mechanical engineer in 1914. He was later appointed general superintendent of the blast furnace division of the Lebanon plant and promoted to the assistant general managership of the Steelton plant. Before going to the Buffalo district, Mr. Entwisle was superintendent of the Saucon division of the company.

❖ ❖ ❖

IRVING SANDS OLDS has been elected a director and member of the finance committee of the United States Steel Corp. for the term expiring in 1939. He was graduated from Harvard Law School in 1910 and became secretary to the late Justice Holmes of the United States Supreme Court. He became a member of White & Case in 1911 and has since been engaged in legal work related to matters of organization and administration of corporate business enterprises.

E. F. ENTWISLE

IRVING SANDS OLDS

❖ ❖ ❖

R. H. SONNEBORN, heretofore special representative for the Republic Steel Corp., has been named assistant manager of sales, pipe division, succeeding CHARLES W. EAST, who was recently made district manager of the Houston district. MARTIN I. SHEA will continue as the other assistant manager in the pipe division, which position he has held for the past eight years. Mr. Sonneborn was born in Pueblo, Colo., and studied mining engineering at the Colorado School of Mines. In 1921 he received a mechanical engineering degree from the University of Michigan. He was associated with the Colorado Fuel & Iron Co. upon graduation and later entered the sales department of the Youngstown Sheet & Tube Co. He became identified with the Republic company in January of this year.

R. H. SONNEBORN

❖ ❖ ❖

WALTER P. SOUTHARD has joined the staff of the Trundle Engineering Co., Cleveland, and will deal with special management and sales problems of the company and its clients. Mr. Southard has had long experience in engineering, auditing and statistical work, mine management and sales promotion and manufacture. He served for a time as secretary-treasurer of the Baker-Raulang Co., Cleveland, from 1918 to 1930 as vice-president and general manager of the J. P. Burton Coal Co., was affiliated with

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TEST THIS WELDIT GASAVER FREE FOR TWO WEEKS IN YOUR PLANT

the Seaver - Brinkman - Gerstenberger advertising and sales promotion agency, Cleveland, and later as sales manager of the Burt Explosives, Inc., now a division of the American Cyanamid & Chemical Co.

❖ ❖ ❖

HARRY S. ANDRICH has been placed in charge of engineering and sales of the Snyder Tool & Engineering Co., Detroit.

❖ ❖ ❖

FRANK O. LEITZELL, whose appointment as vice-president in charge of machinery sales of the Lewis Foundry & Machine Co.,

F. O. LEITZELL

Groveton, Pa., was announced in the Oct. 22 issue of THE IRON AGE, is a graduate of Penn State College with a degree in mechanical engineering. After leaving college, he was employed by the American Locomotive Co. in Pittsburgh, where he served a special two-year apprenticeship. His next position was with the H. K. Porter Co., Pittsburgh, in the designing department and when he left this company in 1919 he was assistant general manager. Following this position he went with the Blaw-Knox Co. as sales manager in the welding department and remained there until June, 1935, when he became sales manager of the machinery department of the Lewis Foundry & Machine Co., which position he held until his present appointment.

❖ ❖ ❖

J. S. ALLISON, JR., formerly manager of the high-temperature insulation department, building products division, Armstrong Cork Products Co., has been appointed Chicago district manager of the refractories sales department of the Babcock & Wilcox Co. He will make his headquarters at 140 South Dearborn Street. H. J. SHANER and R. M. ONAN, who have been handling the sale of refractories in the Chicago district for several years, will assist Mr. Allison.

❖ ❖ ❖

PAUL J. GALBREATH has been added to the sales staff of Marr-Galbreath Machinery Co., Pittsburgh. He is the son of M. D. GALBREATH, treasurer, and was graduated from the Carneigie Institute of Technology in June.

ERSKINE RAMSAY, who is chairman of the board of directors of the Alabama By-Products Corp., Birmingham, has been awarded the Saunders Gold Medal of the American Institute of Mining and Metallurgical Engineers. He has been identified with mining operations in the Birmingham district since 1887, when he went there as an engineer with the Tennessee Coal, Iron & Railroad Co. Later he and the late G. B. McCormack organized the Pratt Consolidated Coal Co., which became one of the largest producers of commercial coal in the South. Some years ago this

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company was absorbed by the Alabama By-Products Corp. Mr. Ramsay has a distinguished record as an engineer and has invented a large number of machines and devices for mining work.

WILLIAM CORDES SNYDER, JR., whose appointment as vice-president and manager of roll sales of the Lewis Foundry & Machine Co., Groveton, Pa., was announced in the Oct. 22 issue of THE IRON AGE.

N. W. STORER, internationally known for his contributions to major railroad electrification projects, has retired after 45 years of service with the Westinghouse Electric & Mfg. Co. At his retirement he was consulting railway engineer of the company. Among electrification projects in which he was active were the New York, New Haven & Hartford Railway; Pennsylvania Railroad; St. Clair and Hoosac tunnels; Chicago, Milwaukee & St. Paul, and the Great Northern. His latest contribution to transportation problems was the design of a bi-way system of continuous trains to provide mass transportation in congested areas.

Mr. Storer joined the Westinghouse organization immediately after his graduation from Ohio State University in 1891. As first assistant to the late Benjamin G. Lamme, he developed a line of small direct current multi-polar generators and motors that became the Westinghouse standard for more than 10 years. Since 1912, Mr. Storer's work has been along general lines. His thorough knowledge of railway electrification and design have been helpful to subways, street cars and interurban railways, to the Chicago, Milwaukee & St. Paul, for the Detroit & Ironton, the Great Northern and other great railway systems.

He was manager of the American Institute of Electrical Engineers from 1911 to 1914 and served two terms as vice-president of that organization and has been a member of its sub-committee on standards for more than 20 years. He has been a member of the International Electro-Technical Commission since 1920 and chairman of the advisers on traction motors for the United States national committee of that commission since 1925. He is one of the 1000 members of the National Economic League.

Scrap Institute to Meet in Cincinnati

THE ninth annual convention of the Institute of Scrap Iron and Steel will be held at the Netherland Plaza Hotel, Cincinnati, Jan. 14 to 16. Committee and board meetings will take up most of the first day, with a stag social event closing the program. The second day will be devoted to an open forum to discuss the problems of the industry, followed by the annual formal banquet, while the annual business meeting will be conducted for the election of the new board of directors and officers on the third and last day.

The convention committee consists of the following: David J. Joseph, chairman; George L. Sturm, Cincinnati, secretary-treasurer; Ben F. Schottenfels, Cincinnati, chairman, and Malcolm Fleming, Cincinnati, entertainment committee; Lee J. Workum, Cincinnati, chairman, banquet committee; Harry Silverstein, Charleston, W. Va., chairman, and Henry Israel, Dayton; Hyman Moskowitz, Cincinnati; Roy Pryse, Cincinnati; Joe Ebner, Springfield; Ed Schlezinger, Columbus; and M. Duberstein, Dayton, registration committee; M. D. Friedman, Ashland, Ky., chairman publicity committee.

This Week on the Assembly Line

(CONCLUDED FROM PAGE 69)

wider and more massive. They have a higher crown and a lower dip in front.

In addition to the Royal, which is made in 10 body styles, Chrysler continues the Imperial, the Custom Imperial and the Airflow, the last of which remains practically unchanged in body style with the exception of radiator grille treatment. The new radiator grille is fashioned from chromium horizontal bars in a form that blends into the flowing lines of the hood. Louvers have also been changed. Overdrive is standard equipment on the Airflow and on the Custom Imperial and is optional on other

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models. It is not available on the DeSoto.

The New Pontiac

Pontiac enters the 1937 automobile year with a Deluxe 6 and a Deluxe 8 that are longer in wheelbase, roomier and have larger and more powerful engines with improved performance and economy. Wheelbases are 5 in. longer for each series. Tops are 1 in. lower with more of a streamline slope of the body line back from the high point. As in other General Motors units, the Fisher bodies now have 100 per cent steel construction throughout. Head room has been increased in the inside by lowering the floor and the door sills, although conventional spiral bevel pinions are still used on the rear axle. This reduction in floor level has been accomplished in another way, by the use of the Hotchkiss type of drive in conjunction with a dual propeller shaft. In using this construction, torque tube drive has been abandoned and the driving torque loads are now carried through the rear springs which necessarily have been redesigned, together with their seats and mountings.

The semi-floating rear axle has been completely redesigned for the new style of drive. It is being built in a new $3,000,000 plant equipped entirely with new machinery. The differential carrier is a chrome-nickel casting, while the ring gears and pinions are forged from nickel-molybdenum alloy steel. The propeller shaft is divided into two parts with the forward half integral with and supported by the transmission. Connecting the front propeller shaft with the rear axle is a short shaft with needle bearing universal joints at each end. A sliding coupling at the rear of the transmission makes slip joints in the universals unnecessary. Aside from eliminating the necessity of a tunnel in the rear of the body, this type of drive is easy to balance and thereby eliminates vibration.

As in many other cars this year, Pontiac has stepped up its displacements on the engines from 208 to 223 cu. in. on the Six and from 232 to 249 cu. in. on the Eight. Top speeds and acceleration have been increased by this improvement in brake horsepower. Through a host of detailed changes in engine design Pontiac engineers have been able to maintain the same fuel economy which has featured this car, despite the increased performance. Unlike Buick and Chevrolet, Pontiac retains an L-head motor with comparatively short stroke crankshafts.

THE services of Standard Oil engineers are simply this: They make a personal survey of your plant at any time, and at no cost or obligation. They discover every possible cost reduction that can be effected through improved lubrication practices. Years of practical, on-the-spot experience often enables them to make savings where it was thought the opportunity did not exist. Others have found this to be true. Why not you? Phone your local Standard Oil (Indiana) office today and give your men their opportunity to set costs at a definitely established minimum.

Write for booklets covering lubrication problems in your plant. (List subjects or types of machinery in which you are most interested.)

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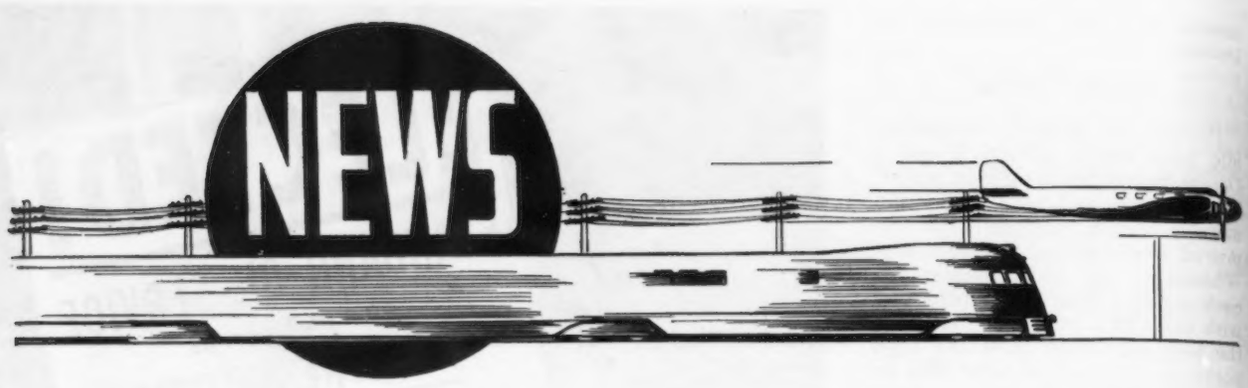

Carnegie-Illinois Grants Concessions to Workers

ANSWERS given by Carnegie-Illinois Steel Corp. to a list of questions submitted a month ago by representatives of 25,000 sheet and tin plate workers disclose important steps in the liberalizing of working conditions in the steel industry.

The list of questions included requests for wage increases, revision of the vacation plan, changes in the pension plan, extension of the group insurance to retired employees and a host of other changes in working conditions. The company acceded to some, refused others and asked for further time to consider additional questions.

On the question of wage increases the company gave the same answer to the sheet and tin plate workers that had been submitted to other groups. While the specific requests for a $5 minimum day could not be granted, the company "will be glad to consider alternate or new requests at any time." In a previous statement to the Homestead works' committee two weeks ago the company signified its willingness to "enter into further negotiations for a compromise agreement." This latter statement is accepted by observers to mean that a wage increase of some kind is in prospect and employee representatives feel the issue will be settled in the near future.

Seniority Rights Recognized

In answering the question on seniority rights, the company agreed to recognize workers' seniority rights and promote the man with the longest service, other qualifications being equal.

The company also obligated itself to discuss all matters of mutual interest with the employee representatives in advance of decision or announcement.

On the question of reviewing the facts before an employee is discharged, the company promised to grant a full review of his case to any worker suspended or discharged as a result of disciplinary action.

Representing an important step in employee relations was the company's statement that it would take steps to disregard "breaks in service" caused by shutdowns, illness, etc., in granting vacations and pensions.

The management turned down the request that group insurance be extended to retired employees, giving as the reason the prohibitive cost of such an undertaking.

Refused also because of the cost factor was the request for a week's vacation with pay for workers with two years' service and up to two weeks for those having over two years' service. At the present time employees having five years' service are entitled to one week's vacation with pay.

To Retain Incentive Plan

The sheet and tin plate representatives had asked for the elimination of the "incentive rate" plan, which was refused by the management, which felt that the plan was beneficial to company and employees alike, both increasing efficiency and earnings.

Another concession granted by

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A NEW BENCH LATHE

WITH THE HARDINGE "CONNECTED BEARING" ENCLOSED HEADSTOCK

The result of evolution and development, this bench lathe is designed on entirely new lines to meet a positive need.

FIRST: OLD TYPE LATHE HEADSTOCK
NEXT: ORIGINAL "CONNECTED BEARING" DESIGN
NOW: HARDINGE "CONNECTED BEARING" ENCLOSED LATHE DESIGN

A modern precision machine tool that *looks the part*—substantial, compact, clean cut—built like an engine lathe yet precise as a watch.

The outstanding feature of the New HARDINGE CATARACT is the *connected bearing, enclosed headstock.* This is *really new design.* The headstock enclosure connects the bearings for: First, Greater accuracy. Second: To allow heavier cuts. Third: To permit higher spindle speeds. Fourth: To completely enclose driving vee belts.

The apparent "connected bearings" features are found only in HARDINGE CATARACT enclosed headstock bench lathes which are made in five practical sizes to meet your particular requirements—½" to 1" collet capacity, 7" and 9" swing.

There is no overhead driving mechanism and any possibility of transmitting vibration to the work is positively eliminated. You will want our bulletin EL presenting additional information and, further, the simplified operation through lever speed control with our modern electrical driving unit for six forward and six reverse spindle speeds without the use of objectionable driving gears, clutches or loose pulleys. Send for a copy.

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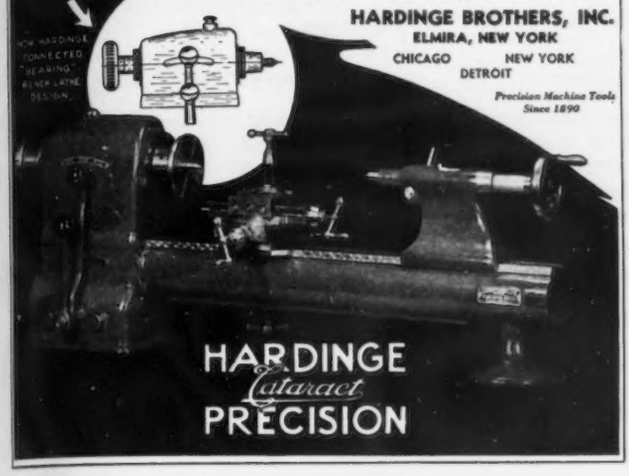

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Look—First at This Picture . . .

Then—at This

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MODERN
BENCH LATHES
MILLING MACHINES
HAND SCREW MACHINES
PAY
DIVIDENDS

Section of Laboratory Tool Room — International Business Machines Corp., Endicott, N. Y.

HARDINGE Cataract Precision Machines have an important part in the development and manufacture of Tabulating Machines, Time Recorders, Sound Systems and Electromatic Typewriters produced by the International Business Machines Corporation.

Modern Hardinge Enclosed Head Bench Lathes, Bench Milling Machines, and Hand Screw Machines are meeting their exacting demands in the inventing, development, laboratory, tool room and production departments.

The International Business Machines Corporation is acquainted with advantages of Hardinge machines. They are acquainted with the modern design for improved appearance, reduced equipment and up-keep costs and the elimination of overhead belting, shafts, countershafts, gears and clutches. **Are you fully acquainted with the possibilities?** If not, refer to this advertisement and ask for bulletins.

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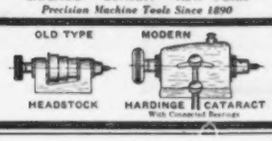
HARDINGE *Cataract* PRECISION



Cataract

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PRECISION
ENCLOSED HEAD BENCH LATHES — BENCH HAND SCREW MACHINES — BENCH MILLING MACHINES

TYPICAL INSTALLATIONS OF MODERN HARDINGE BENCH MACHINES AT LEADING MANUFACTURING ORGANIZATIONS

• *When considering similar machines—make certain that you have a Hardinge proposal* •

HARDINGE BROTHERS, INC., ELMIRA, N. Y.
CHICAGO — NEW YORK — DETROIT

the company was its willingness to cooperate in giving the employee representatives necessary and relevant information in regard to rates, piecework and tonnage earnings or working conditions of specific occupations that are proposed for adjustment.

Other questions such as liberalizing of the pension plan and the placing of girl employees, now receiving less than the standard labor rate, on piece-work basis will be considered further by the Carnegie-Illinois company which asked for "more time to consider."

Statements of policy, in part, covering the more important decisions follow:

Wages

"Due to present economic conditions the management of the Carnegie-Illinois Steel Corp. at this time cannot grant the request as submitted for a flat increase of $1 per day for every employee, with a minimum of $5 per day for labor, but will, of course, be glad to consider alternate or new requests at any time.

Higher Pensions

"A study of the pension plan is now being made, in its relation to the Social Security Act and other features. It is probable that the results of this study will be available before Jan. 1, 1937."

(The employees had asked a pension for retired employees ranging from $60 to $100 a month, compared with an average of $30 now paid.)

Wage Data

"The management will cooperate in providing the employee representatives with all necessary and relevant information in regard to rates and piece-work or tonnage earnings, or working conditions of specific occupations that are proposed for adjustment.

"Salaried rates are individual and are considered as confidential between management and individual. Specific cases where irregularities are claimed to exist, will be given consideration by management.

Labor Announcements

"In principle, the management will obligate itself to discuss all matters of mutual interest with the employees representatives in advance of decision or announcement thereof.

"It must be realized, however, that from time to time matters may arise on which neither adequacy of time nor controlling factors may permit of prior negotiations. On such occasions the management will state to the representatives the reasons for its actions.

Incentive Rates

"It is our opinion that incentive rate plans providing for bonus when properly conceived, have proved beneficial and fully acceptable to the employee involved. Incentive plans are intended to increase efficiencies and to permit of higher earnings in the form of bonuses for better performances.

"Incentive plans should never be applied where there is any hazard to the employee connected with them because of any undue strain in attempting to achieve a better performance.

"Management agrees no such plan will be established without conferring with the employees involved. Incentive rates will be guaranteed on a day basis wherever operating conditions make it practicable.

Discharge Explanations

"The efficient and orderly conduct of the business necessitates that the management shall be primarily responsible for disciplinary action. Management does agree, however, to accord a full review of any such case, will correct any penalty unfairly assigned, and in such case will compensate employee involved for time lost.

Change of Paydays

"The proposal to change the frequency of pay days is complicated by our system of computing cost figures on a calendar month basis, and will require further study before a final answer can be made.

"The management will arrange that checks be cashed by convenient banks without expense to employees."

(The workers had asked that pay day be changed to every other Friday, instead of every 15 or 16 days, and that the company pay in cash.)

Higher Wages for Girls

"Due to character of work and favorable working conditions under which these girls operate, placing of the occupation on the prevailing labor rate (48½c. an hour in Pittsburgh plants), is not justified. A request to place this occupation on a piece rate is being given careful study.

Time and a Half Pay

"The rules now in effect provide for the payment of time and one-half for work in excess of 8 hr. per day or six consecutive turns worked. The management cannot now consider any further extension of bonus overtime payment.

"The present schedule of overtime payment (time and a half for work over 48 hr. weekly) applies to cases when employees are requested by the management to work beyond

Low Sulphur Fuel Oil

For Heat Treating Steel, Copper and Non-Ferrous Metals; for Metal Refineries and for Glass Works. Something new in Oil for Industrials requiring a Low Sulphur Product.

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eight hours per day or six consecutive turns. Changes in working conditions may make it necessary to adjust certain positions from time to time.

"No change in present schedules of working hours is contemplated at this time.

Insurance

"Coverage extended to pensioners are not included in the plan because of prohibitive cost. Even with the employees paying the maximum legal amount permitted, the present and prospective expense to the Steel Corporation would prevent the continuance of the plan. The cost of group insurance must be considered in connection with the cost of the pension plan, which now amounts to $8,000,000 per year.

"It is not legally possible for a retired employee to participate in group insurance. Disability benefits are no longer available on group insurance contracts. The insurance companies have refused to write this coverage on new contracts and continue it on previous contracts only at a higher cost."

Bethlehem Reports Largest Profits of Any Third Quarter Since 1929

THE largest net income of any third quarter since 1929 and the greatest amount of unfilled orders on hand since wartime were reported for the quarter ended Sept. 30, for the Bethlehem Steel Co., by Eugene G. Grace, president.

The company earned $4,575,058, which equaled 84c. a share on the common stock after deducting dividends accrued on the preferred stocks, as compared with $3,431,391, or 49c. a share on the common stock, for the second quarter, 1936, and $701,616, or 75c. a share on the old 7 per cent preferred stock, for the third quarter last year.

Unfilled orders on hand were valued at $93,272,198, as compared with $89,561,632 at the end of the second quarter, and $63,576,027 for the third quarter, 1935.

Mr. Grace said the fourth quarter should be as good, if not better, than the third quarter, and that there was "no indication seen of buying for speculative purposes, nor for important accumulations of inventories by either companies or users. Buying is for current consumption."

Regular preferred dividends of $1.75 a share on the 7 per cent cumulative, and 25c. a share on the 5 per cent cumulative were declared, payable on or before Jan. 2, 1937, to stockholders of record on Dec. 4, 1935.

"Steel production," according to Mr. Grace's statement, "averaged approximately 69.5 per cent of capacity during the third quarter of 1936 as compared with 66.2 per cent during the previous quarter and 37.8 per cent during the third quarter of 1935. Current steel production is approximately 75 per cent of capacity."

The company could operate up to 100 per cent of rated capacity,

Low Cost Handling

Easy rolling trolleys carry heavy loads smoothly over American MonoRail hand or power operated systems.

Write for new book on MonoTractor drive for Overhead Handling

Small installations of American MonoRail often bring remarkable savings in labor hours. With a simple system, lift and carry operations are performed without excessive labor, hence costs are sharply reduced. One operator claims his system does the work of three men. Another states he would require 30% more floor area without American MonoRail.

THE AMERICAN MONORAIL CO.

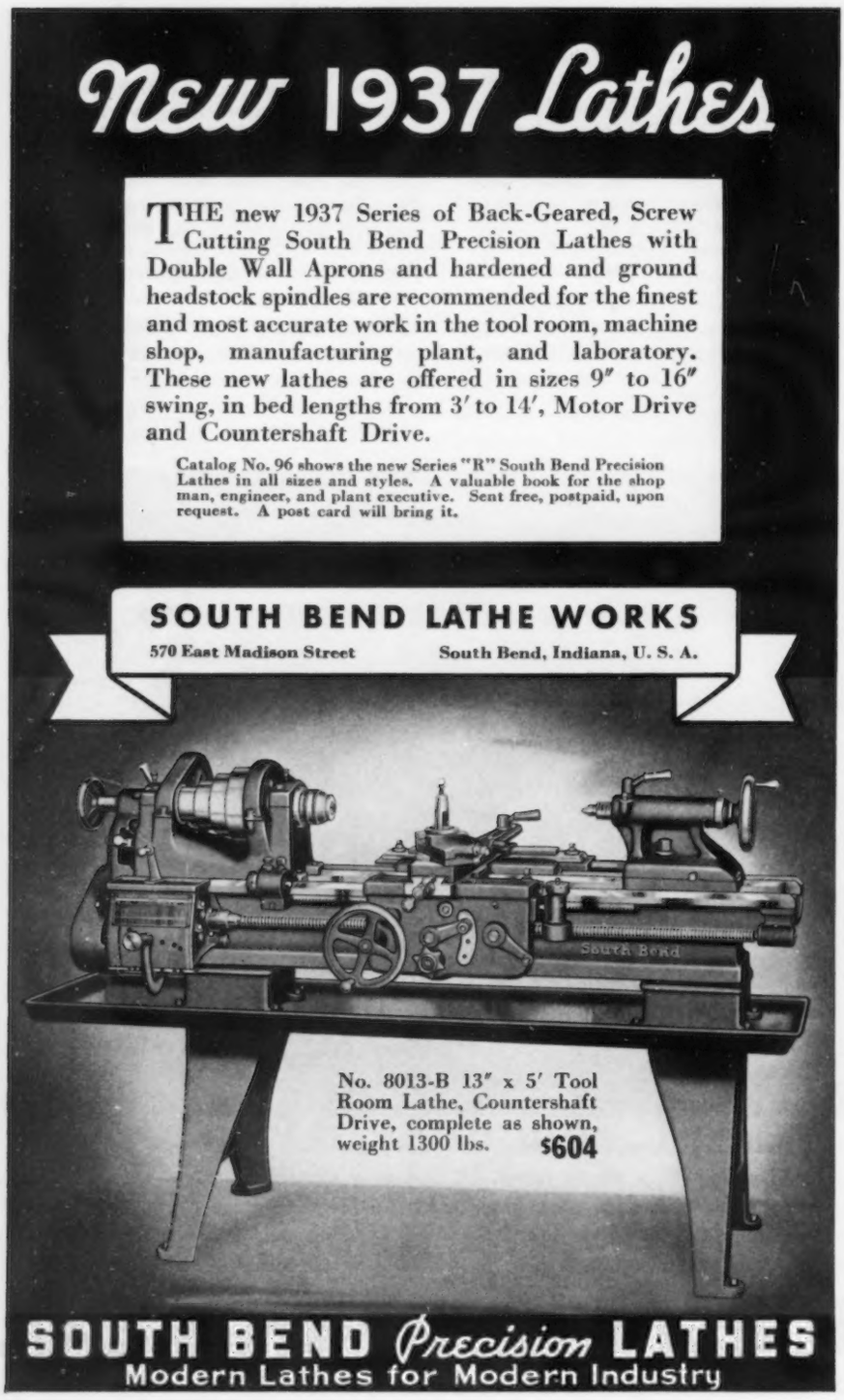
13103 Athens Ave., Cleveland, O.

said Mr. Grace, in reply to a question as to whether 75 per cent operation was not practical capacity.

Mr. Grace said that the new Buffalo continuous mill is operating at 100 per cent of capacity and, with three shifts working, could roll 3000 tons daily, although only about 2000 tons a day on the average is being turned out at present. He attributed much of the increase in the company's operations to the performance of the new mill.

When asked about wages, Mr. Grace replied that discussions on that subject were constantly being held between company representatives and management, but that no definite conclusion had been reached, other than that "if anything has to be done for labor, an increase in selling prices will be necessary."

Provision for taxes, including those on undistributed net income, was made in the statement, but Mr. Grace said that no decision would be made as to the disposition of excess earnings available for dividends until sometime in December when the results of the final quarter could be ascertained more easily, although special board meetings may be called at any time to decide upon extra dividend payments.


New 1937 Lathes
THE new 1937 Series of Back-Geared, Screw Cutting South Bend Precision Lathes with Double Wall Aprons and hardened and ground headstock spindles are recommended for the finest and most accurate work in the tool room, machine shop, manufacturing plant, and laboratory. These new lathes are offered in sizes 9″ to 16″ swing, in bed lengths from 3′ to 14′, Motor Drive and Countershaft Drive.
Catalog No. 96 shows the new Series "R" South Bend Precision Lathes in all sizes and styles. A valuable book for the shop man, engineer, and plant executive. Sent free, postpaid, upon request. A post card will bring it.
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No. 8013-B 13″ x 5′ Tool Room Lathe, Countershaft Drive, complete as shown, weight 1300 lbs. $604
SOUTH BEND Precision LATHES
Modern Lathes for Modern Industry

FINANCIAL NOTES

Wheeling Steel Corp. reports net profit for the quarter ending Sept. 30, of $1,186,660, compared with $648,597 for the same quarter in 1935. Net profit for the nine months ending Sept. 30, 1936, amount to $2,068,859.

Koppers Co., Pittsburgh, on Oct. 27, filed with the Securities and Exchange Commission a registration statement for the sale of $25,000,000 of 15-year first mortgage and collateral trust bonds. Proceeds from this issue will be used to redeem $17,746,000 principal amount of the company's 5½ per cent debenture gold bonds at 103½, totaling $18,367,110; to retire notes payable in amount of $4,650,000; and to increase working capital. Remainder of the company's outstanding 5 per cent and 5½ per cent debenture gold bonds, amounting to $9,057,000, will be redeemed with other funds, of which $3,000,000 has been borrowed from commercial banks on one to five-year unsecured serial notes at rates of from 1½ to 3½ per cent.

Westinghouse Electric & Mfg. Co. and subsidiaries had third quarter net income of $3,185,728 after depreciation, new Federal income taxes and partial provision for surtax on undivided earnings. This compares with $4,205,524 in the preceding quarter and $2,557,452 in the September quarter last year. In the nine months ended Sept. 30 net income was $11,123,706 after deductions, compared with $8,822,640 in the same period of 1935.

The 46th edition of McGoldrick's Handbook of Canadian Customs-Excise Tariffs has just been published in a totally revised form which includes the provisions of the Canada-United States Trade Agreement and recent customs and budget changes, and is said to render previous issues obsolete. Contained in the 1300 pages are complete information on the Customs Act, the War Revenue Act, and the regulations founded on them. The tariff is arranged both alphabetically and in group form. Copies are available from the publishers, McMullin Publishers Ltd., 417 St. Peter Street, Montreal, at $4 per copy.

Other Steel Companies Show Greater Third Quarter Earnings

REPUBLIC STEEL CORP. had a consolidated third quarter net profit of $3,311,556, compared with profit of $507,731 for the same quarter of 1935. This was after deduction of $1,040,707, representing interest on funded debt, depreciation and depletion charges of $2,599,580 and provision for estimated Federal income and undistributed profit tax of $1,118,207. The net for the company in nine months this year amounted to $6,333,649, including $2,661,062 net earnings for the second quarter.

Youngstown Sheet & Tube Co.'s third quarter net profit equaled $2,359,998 as against $574,799 in the corresponding period last year. In the second quarter this year its net amounted to $2,588,089. The profits were figured without deduction of any Federal surtax on undistributed earnings. The seventh ranking major concern in the industry, Inland Steel Co., disclosed that its business in the quarter ended Sept. 30 proved to be the best in its history. Its net earnings in this period, totaling $3,788,198, compare with $3,298,191 for the second quarter and $1,810,203 for the third quarter of 1935. The earnings were equal to $2.52 a share on outstanding stock of the company, and included third quarter profits of Milcor Steel Co., which was acquired by Inland on July 1. Directors of the company approved a 75c. cash dividend on the capital stock.

Jones & Laughlin Steel Corp. and subsidiaries had a quarterly net profit of $1,870,866 after interest, depreciation, taxes and charges, equivalent after preferred dividend requirements, to $1.46 a share on 576,320 shares of common stock. No provision was made for Federal surtax on undistributed profits. The earnings compare with $1,115,733 in the second quarter and $233,914 in the September quarter of last year. For the first nine months the company's net profit aggregated $2,052,320, as against a net loss of $516,463 in the comparable period of 1935. An accumulation of $1.75 a share on the 7 per cent preferred stock was voted payable Dec. 15 to stock of record Nov. 30, leaving arrears of $28.25 a share.

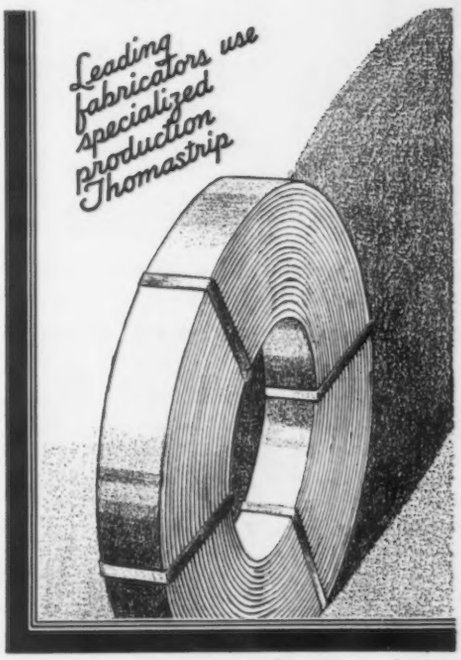
The preliminary report of the Wickwire Spencer Steel Co., including Wickwire Spencer Sales Corp. and American Wire Fabrics Corp., showed a profit in the third quarter of $222,030 after ordinary taxes, depreciation, interest and other charges. This compares with profits of $120,998 in the preceding quarter and $4,655 in the September quarter of 1935.

Directors of the American Rolling Mill Co. at a meeting on Oct. 27 voted an extra dividend of 75c. a share on the company's common stock and declared the regular quarterly dividend of 30c. a share. The extra is payable on Dec. 15 to holders of record Nov. 14, while the regular dividend is payable Jan. 15 next against stock of record Dec. 15. The board of directors also authorized calling for redemption and payment on Dec. 5 at 102½ and accrued interest all outstanding 4½ per cent convertible debentures due 1945. There are outstanding approximately $12,700,000 of these debentures.

Look to the Specialist
to best serve your requirements
for cold rolled strip steel

Year after year Thomas Steel has the privilege of proving to an increasing number of metal fabricators that better products, better service and better profits result from the use of Thomastrip. Thomas specialized production provides exclusive attention and concentration on the proper specification, exacting manufacture and dependable delivery of *one* product—cold rolled strip steel. The experience, the modern facilities, and the engineering resourcefulness of this specialized organization assures to each individual customer that complete dependability of material and service which progressive management demands. It will pay you to investigate Thomastrip for your product.

THE THOMAS STEEL COMPANY
WARREN, OHIO
Specialized Producers of Cold Rolled Strip Steel



Thomas Strip
COLD ROLLED STRIP STEEL
BRIGHT STEEL-ZINC COATED
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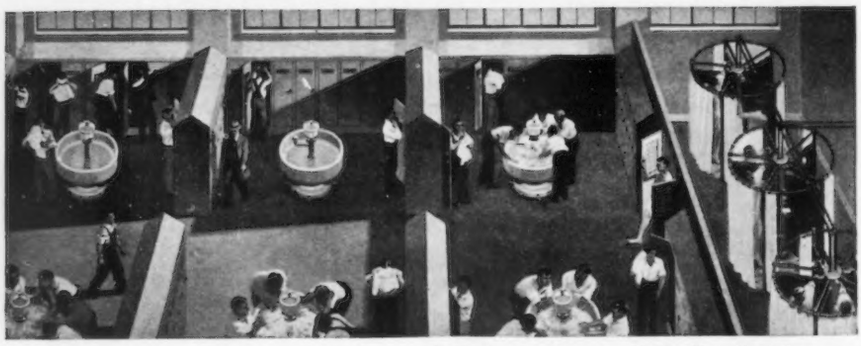
Gas Association Reviews Developments

MEETING in Atlantic City, on Oct. 25 to 30, the American Gas Association heard a paper entitled "A Recapitulation of the Progress Made in Applying Air Conditioning to Industrial Plants," by C. W. Swenson, of the Consolidated Edison Co. The role of gas in hot water, steam and power generation was reviewed by W. W. German, of the Montana Power Co., Hale A. Clark, of the Detroit City Gas Co., considered the function of gas apparatus in the ferrous metals industries, and W. Wirt Young, of the Connecticut Light & Power Co., reported on the use of gas equipment by non-ferrous industries. Also, the "Engineering Improvements in Industrial Gas Apparatus and Their Economic Effect" were described in a paper prepared by O. L. Maddux, of the United Gas & Fuel Co. Copies of any one or all of these papers may be secured from the American Gas Association at 420 Lexington Avenue, New York.

In the Maddux paper, it was pointed out that there have been a number of improvements in gas equipment and controls which are helping to make industrial gas the "first-thought-of" fuel in industry. A number of improvements in small industrial oven furnaces were described, mention was made of a new type of furnace equipped with atmospheric burners which is finding favor with small tool shops, and production data were presented for small continuous retort and conveyor furnaces for hardening, carburizing and nitriding and other heat treating operations in tool room and production shops.

Detailed attention was paid to various types of controlled atmosphere furnaces, and various installations of gas engines as sources of power were described. Mr. Maddux pointed out in conclusion that the development of industrial equipment has been far in advance of the industry's ability to saturate the market. Furthermore, it was stated that the market for industrial gas is steadily growing and there has been a continued development of new uses for gas fuel and a constant improvement in the design and application of gas to heating operations.

Modern Foundries Save With This Kind of Washroom Equipment



Typical arrangement of Bradley Washfountains and (at right) *5-Stall Circular Showers.*

Improves Morale — Prevents Disease Reduces Water Costs

Hundreds of Bradley Washfountains are furnishing modern sanitary washing facilities in scores of foundries. (See column at left)... One Washfountain serves 10 men at a time, supplying clean running water to each—yet the total water for all is but a little more than for one man at an ordinary wash basin.

Here Are Some Foundries With Modern Bradley Washing Facilities

Amer. Brake Shoe & Fdy.
Amer. Car & Fdy.
Amer. Steel Fdys.
Chicago Hdwe. Fdy.
Dayton Steel Fdy.
Erie M. I. Co.
Falk Corp.
Fittings, Ltd. (Canada)
Hubbard St. Fdy.
Massillon St. Cstg.
Muncie Mal. Fdy.
U. S. C. I. P. & F.

Workers like the low setting of the bowl —they can lean over and wash to the waist. Time is saved, morale improved, and overall efficiency raised.

Let us give you complete information on Bradley Washfountains and Group Showers—they can be easily installed in your present buildings — and water savings alone will pay for them. BRADLEY WASHFOUNTAIN CO., 2239 W. Michigan Street, Milwaukee, Wisconsin.

Write for this Catalog No. 435

BRADLEY
WASHFOUNTAINS and SHOWERS

British Steel Output At Record High

BRITISH production of steel has been maintained at peak levels during the current year, according to a report to the Commerce Department from the American consulate-general, London. Aggregate output in the first nine months totaled 8,617,200 tons, compared with 6,462,500 tons in the corresponding period of 1935, an advance of 2,154,700 tons. Production in September at 1,027,000 tons set an all-time monthly record and exceeded by 42,800 tons, the previous peak established in April of the current year.

If the monthly output continues near the 1,000,000-ton level to the end of this year, the aggregate production for 1936 will approximate 11,500,000 tons, the report points out.

British production of pig iron in the first nine months of 1936 totaled 5,700,000 tons, against 4,272,100 tons in the corresponding 1935 period, an increase of 1,428,800 tons. This increase is approximately 700,000 tons less than the nine months' output gain in steel ingots and castings. The difference is accounted for chiefly in the greater use of scrap; also by the use of existing stock of pig iron.

Galvanizers Will Meet at Pittsburgh

THE first meeting of the Galvanizers Committee, organized to consider the technical phases of hot-dip galvanizing, will be held at Pittsburgh, Nov. 18 and 19. This meeting has been called by F. G. White, chief of the department of metallurgy and inspection, Granite City Steel Co., who is chairman of a temporary organizing committee, including G. A. Brayton, Newport Rolling Mill Co., F. W. Brown, Inland Steel Co., N. E. Cook, Wheeling Steel Corp., B. P. Finkbone, American Rolling Mill Co., H. E. McCoy, Gulf States Steel Co., and J. L. Schueler, Continental Steel Corp. Ernest V. Gent, secretary of the American Zinc Institute, is acting as secretary of the Organizing Committee.

The program of the two-day meeting will consist of a morning and afternoon session on each day, the subjects for discussion to cover technical and operating problems in the galvanizing department, with special reference to the galvanizing of sheets. Plans for a formal organization, including the adoption of a constitution and by-laws, will be taken up at this meeting. Also, a permanent governing body will be elected to take the place of the temporary organizing committee.

Pending final organization, it has been decided to limit the attendance at the forthcoming meeting to executive, operating and technical men of companies producing galvanized sheets.

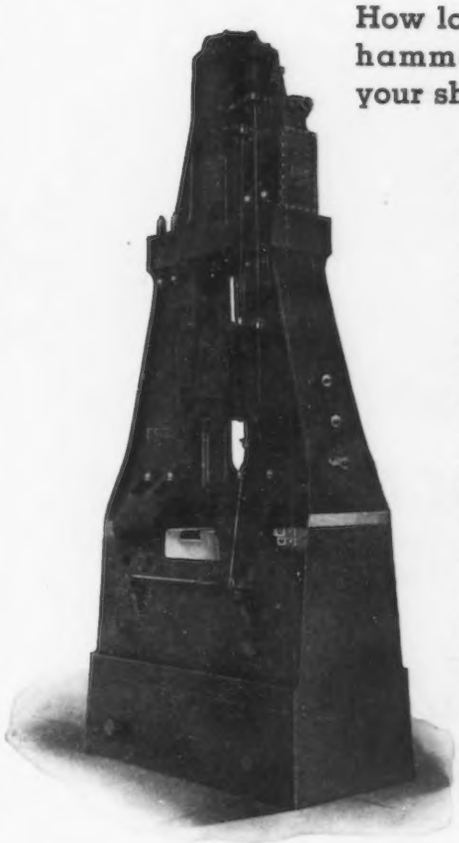
Republic Assembles Stainless Steel Data

A NEW series of booklets on Enduro stainless steel has just been released by Republic Steel Corp., Republic Building, Cleveland. The booklets, five in number, are characterized by layout and typographical treatment radically different from Republic's previous publications on this product. Cover illustrations are reproductions of photographs of various mill operations in the production of Enduro. All of the booklets are profusely illustrated.

First in the series is a booklet of general nature, explaining the reasons for the amazing rise in popularity of stainless steel and illustrating many of the more important applications of Enduro. A highly useful feature of the booklet is a chart listing the analyses and detailed properties of 13 of the principal types of Enduro, contrasted with the properties of a common carbon steel, SAE 1020. Another useful table sets forth the degree of corrosion resistance of four leading types of Enduro in the presence of some 300 foods, chemical products and reagents.

A second book features detailed data on Enduro 18 and 8 and its several variations. The third booklet is devoted to the straight-chromium types of Enduro—AA, S, S-1 and FC. The fourth booklet contains information on heat-resisting types of Enduro—HCN, HC and NC-3. The fifth booklet treats Enduro 4 to 6 per cent chromium steels. These latter steels are not stainless but are intermediate between ordinary carbon and stainless steels.

Is Ten Months Too Long?



How long would it take a new hammer to pay for itself in your shop?

A recent survey of opinion of a number of forge shop executives showed it was their average belief that modern ERIE drop hammers would pay for themselves in ten months. But compared to hammers ten or fifteen years old — and about 80% of the hammers in operation are more than ten years old—probably ten months is too long.

Labor costs are bound to continue upward. Only with modern equipment will you get a corresponding increase in production. You can't afford to run those old hammers. What investment today will pay such handsome returns as the purchase of Erie Forge Shop Equipment?

ERIE FOUNDRY COMPANY, ERIE, PENNA., U. S. A.

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PARIS, FRANCE 8 RUE DE ROCROY

ERIE

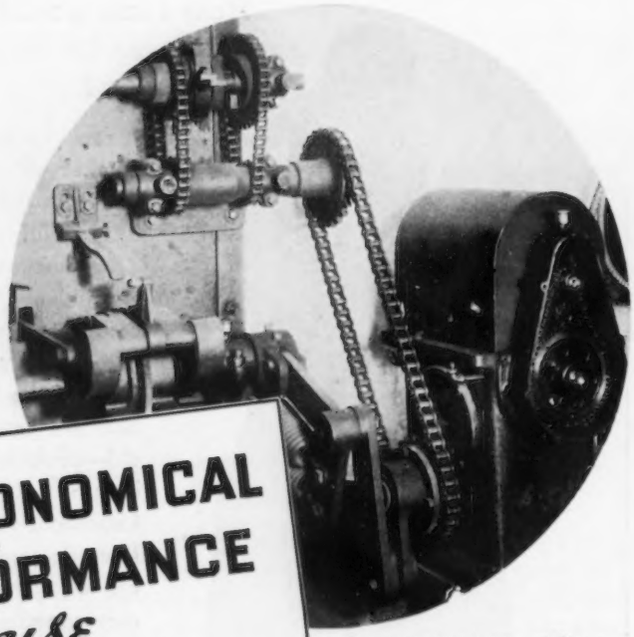
Motor Wheel Corp. Builds Foundry

MOTOR WHEEL CORP. will break ground immediately for a new foundry to be erected on property on the Michigan Central Railway, north of McKinley Street, Lansing, Mich. The foundry buildings and melting equipment will be provided by Motor Wheel and leased to the Campbell, Wyant & Cannon Foundry Co. of Muskegon, Mich., which will furnish and install the manufacturing equipment and operate the foundry exclusively for Motor Wheel.

It is expected that the foundry will be in operation early in January. Approximately $1,000,000 will be invested in buildings and equipment, and when the foundry is in full operation about 400 men will be employed.

The foundry will be used to make "Centrifuse" brake drums, a joint development of Motor Wheel Corp. and Campbell, Wyant & Cannon Foundry Co. and first introduced as original equipment on a number of leading automobiles in 1931. D. J. Campbell, president of Campbell, Wyant & Cannon, is the inventor of the process and machinery whereby iron is centrifugally cast and fused into a rolled steel ring thus combining an ideal fine-textured cast iron braking surface with the strength of steel and resulting in a considerable saving of weight in the finished brake drum.

The demand for "Centrifuse" drums has increased so rapidly that additional facilities became necessary immediately. Motor Wheel had no desire to enter the field of foundry practice, foreign to its own business, and an arrangement has therefore been completed whereby Campbell, Wyant & Cannon will lease this new, modern foundry and equip it with new specialized machinery for the centrifugal casting of iron. The new foundry buildings have been so laid out that future requirements can readily be cared for. While the foundry in the beginning will be used exclusively for the manufacture of "Centrifuse" drums, there are many possibilities of expansion to handle other requirements of this corporation.



The Perfection stoker uses Baldwin-Duckworth triple width roller chain between 1200 R.P.M. electric motor and gear reduction unit. Drive shaft is operated by single roller chains.

For ECONOMICAL PERFORMANCE use Roller Chain

To operate economically, this stoker must receive a steady, uninterrupted flow of power. And Baldwin-Duckworth roller chain furnishes the strength and dependability demanded by the job. The multiple strand chain operates on short centers at high speeds—while the single strand chain withstands the slow, heavy drag of the stoker mechanism.

Wherever economy depends upon trouble-free power delivery—use Baldwin-Duckworth precision machined roller chain. Rugged and accurate, it gives longer life with fewer repairs.

Send for a copy of our catalog. It shows all types of roller chains and accurate cut sprockets. Baldwin-Duckworth Chain Corporation, Springfield, Mass.

BALDWIN—DUCKWORTH

Raises Axle Strength By Surface Rolling

A NUMBER of recent investigations made by the Timken Roller Bearing Co. under the direction of T. V. Buckwalter, vice-president, and Dr. O. J. Horger, research engineer, indicate that surface rolling of an axle at a press fit section practically restores the full strength of the axle. This procedure makes it possible to utilize in press fitted assemblies practically the same strength as is available in plain axles which do not have press fitted members.

It has been pointed out by this company that a press fit member ordinarily reduced the fatigue strength of an axle to less than half the strength of a similar axle not having a press fitted member. For instance, a 2-in. axle made of SAE 1045 steel normalized and drawn and then assembled with a press fitted member will have a fatigue strength of 14,000 lb. per sq. in. without surface rolling. However, if it is surface rolled with 2400 lb. per roller, the fatigue strength will increase to 33,000 lb. per sq. in.

To determine the effect of surface rolling in large axles and to secure additional data relating to forging and heat treating practice as well as on other problems associated with large sections, the Timken company is now building a fatigue testing machine capable of dealing with axles up 13½ in. in diameter.

Clyde G. Conley Again Heads Fabricators

THE American Institute of Steel Construction has re-elected, to serve for another year as president, Clyde G. Conley of the Mount Vernon Bridge Co., Mount Vernon, Ohio. Mr. Conley was first elected president of the institute in October, 1932.

Other officers re-elected were Clyde MacCornack of the Phoenix Bridge Co., Phoenixville, Pa., first vice-president; H. A. Fitch of Kansas City Structural Steel Co., Kansas City, Kan., second vice-president; Robert C. Post of Post & McCord, Inc., New York, treasurer; Robert T. Brooks, executive vice-president and assistant treasurer; and V. G. Iden, secretary.

All of these elections were made by the board of directors immediately upon the adjournment of the fourteenth annual convention at White Sulphur Springs, W. Va.

One new director was voted by the convention, W. B. Truitt of Carolina Steel & Iron Co., Greensboro, N. C.

A report of other news of the convention was published in THE IRON AGE of Oct. 29, p. 58.

September Exports of Iron and Steel Drop

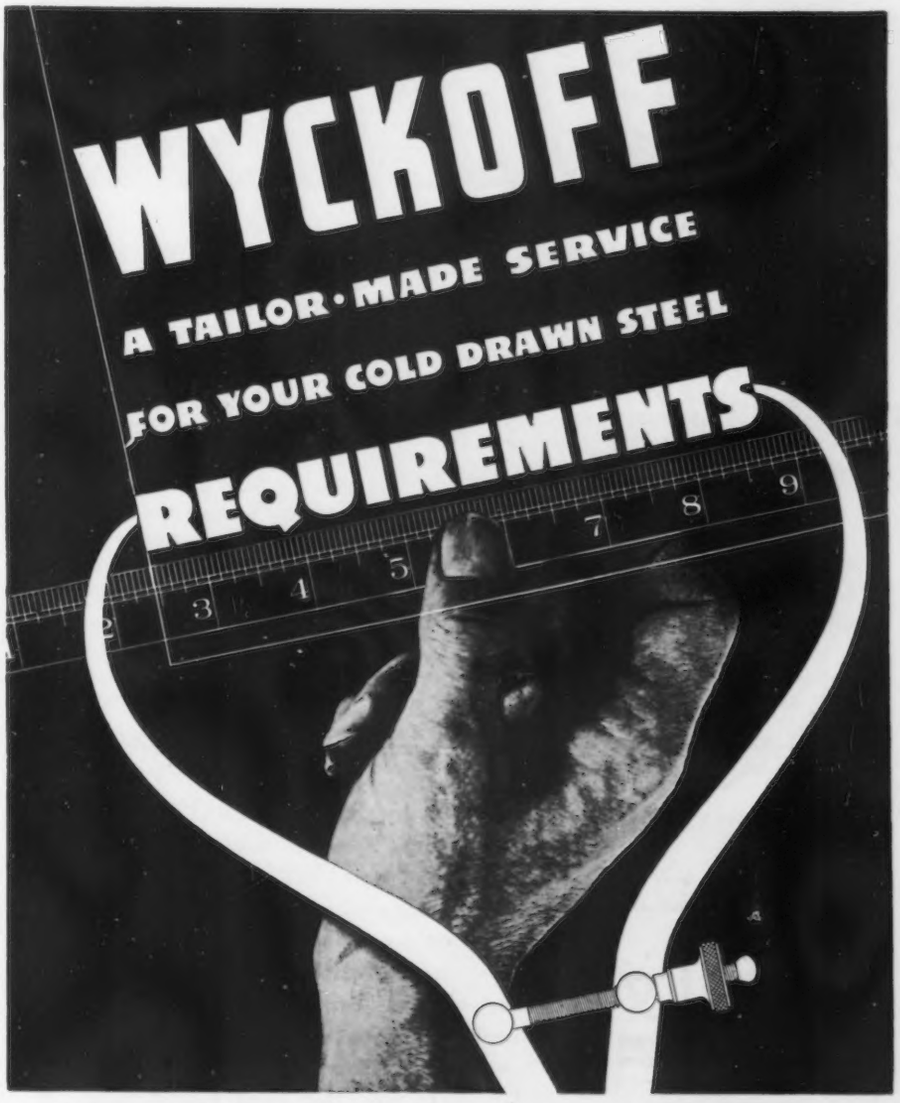
WASHINGTON, Nov. 2.—Exports of iron and steel products in September totaled 78,655 gross tons, valued at $5,725,286, a decline of 17.8 per cent in quantity and 9 per cent in value when compared with August shipments. Exports of scrap showed an even further decline, amounting to 157,111 tons, valued at $1,787,288, 21.2 per cent in quantity and 22.8 per cent in value under August exports.

The largest decline in exports of finished steel was in heavy rails, whose September export movement amounted to only 2184 tons, a drop of 9584 tons. The chief item of export was black steel sheets, 10,178 tons.

Those American firms and individuals who wish to sell products to various branches of the Federal Government may now secure guide books from the Department of Commerce, Washington, which list the various purchasing offices, describe purchasing procedure and contain concise instructions concerning methods of soliciting inquiries and submitting bids.

Metallurgical Books And Articles Indexed

A NEW booklet entitled "How to Find Metallurgical Information," by Richard Rimbach, 1117 Wolfendale Street, Pittsburgh, lists all the handbooks of metallurgical interest in print on Aug. 1, 1936, and all the metallurgical books, both foreign and domestic, in print on the same date. A subject index of the books is included as well as a key to the publishers' names and addresses. Also listed are all the current (world) metallurgical periodicals, all regular company periodicals, and, also, a listing of company literature which appears irregularly. Mention is also made of all the metallurgical abstract services (world) with individual listing of costs and subjects covered by each service. This booklet may be obtained from Mr. Rimbach at $1 per copy.



You can profitably utilize Wyckoff *controlled* Cold Drawn Steel Service . . . scientifically solves steel problems involving uniformity of product, depth of hardening, toughness and surface hardness of penetration . . . enables us to duplicate the latest and most efficient grade of cold drawn steel for your purpose, time after time, with laboratory exactness. It will assure a decided saving in your manufacturing costs. Investigate.

WYCKOFF DRAWN STEEL COMPANY

General Offices: First National Bank Bldg., Pittsburgh, Pa.
Mills at Ambridge, Pa. and Chicago, Ill.
Manufacturers of Carbon and Alloy Steels
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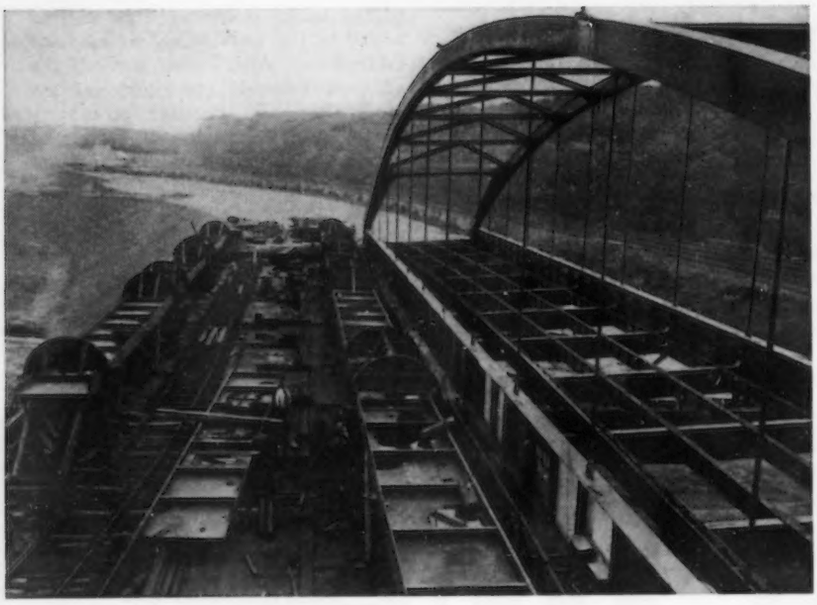


333-Ft. Welded Bridge Erected in Germany

MANY interesting papers dealing with bridge construction were read at the recent meeting of the International Institute of Steel Construction, at Berlin, Germany. Guests were particularly entertained by a detailed description of the largest bridge in Europe, which is now under construction at Seeland-Falster, Denmark. Over 20,000 metric tons of chrome steel and 100,000 cu. meters of cement were used; the total height of the bridge is 85 ft., the length is 10,425 ft. with additional length on firm ground, the width and length of each span is 39 ft. and 445 ft. respectively. The bridge will carry both automobile and railroad traffic.

Another paper presented at the meeting which attracted great interest dealt with Germany's largest all-welded (electric arc) bridge at Kaiserberg near Duisberg. Over 1100 metric tons of high-tensile alloy steel (tensile strength of 83,000 lb. per sq. in.), designated as ST 37 and ST 52, is being used. The overall length is 335 ft., and the design is so as to accommodate both railroad and automobile traffic. It will be noticed in the accompanying photograph that the joining rods (by which the bridge span is connected with the bridge) are not cross girders but are thin rods of ST 52 steel. The second largest all-welded bridge in Germany is 228 ft. long.

Otis Plant Closed As Workers Strike

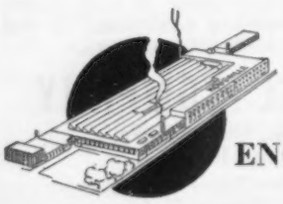
OTIS STEEL CO., Cleveland, closed down its blanking department last week rather than submit to demands for wage increases made by employees belonging to the Amalgamated Association of Iron, Steel and Tin Workers. The closing of the plant, according to a statement of E. J. Kulas, president of the company, was made necessary by the refusal of a committee representing the employees to permit normal production in the blanking department. Mr. Kulas charged that the employees had cut production 50 per cent below normal.

On Oct. 16 the company instituted a new system of computing wages in the blanking department which Mr. Kulas stated was designed primarily to eliminate certain inequalities in wages and also to make possible the earning of even higher wages. This led to the restriction in production. Later, according to Mr. Kulas, demands were made for prohibitive and excessive hourly rates plus a tonnage bonus. The men presented an ultimatum that they would not return to normal production unless such wage rates and tonnage bonuses were granted in full. On receipt of this ultimatum the company shut down the department and advised its customers that it was unable to meet their requirements and had no alternative but to return their dies. The men later voted unanimously to return to work under conditions existing before the shut-down and asked for a conference with the Otis company management.

Standard Brake Shoe & Foundry Co. will hold an old-fashioned Southern barbecue on Saturday, Nov. 14, at Memphis, Tenn., in celebration of the formal opening of its new plant and its 86th anniversary.

Your Ally—

HOUDE has special metal working machinery, special metal working processes, special men, special engineers—and with them produces parts or complete assemblies for many nationally known manufacturers, solely on the basis of greater precision, greater speed and lower costs than their own facilities permit. • It may be that Houde can do as much for you. The way to find out, obviously, is to ask us to talk it over.



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German Sheet and Plate Exports Rise

GERMANY'S export trade in steel plates and sheets registered a pronounced improvement in the first half of this year when compared with the corresponding period of 1935, according to the Commerce Department. Shipments abroad advanced from 225,884 metric tons in the January-June period of 1935 to 291,566 tons in the first six months of 1936, representing a volume increase of 29 per cent and a value increase of 26 per cent. The increased trade in these items was largely due to a marked extension of business with Denmark, the Netherlands, Russia, and, to lesser degree, with Spain, Sweden, Switzerland, Brazil, and the United States. Losses were recorded in the trade with a number of other countries, including Belgium-Luxemburg, Bulgaria, Finland, France, Italy and Portugal.

Reports on Corrosion Of Non-Ferrous Pipe

THE effect of soils on iron and steel pipe has been studied by the soil corrosion section of the National Bureau of Standards for many years. For the past several years this work has been supplemented by burying a great variety of non-ferrous materials and alloys in soils where serious corrosion of iron was known to occur.

After examining 6500 specimens of non-ferrous pipe materials, which had been buried underground for various periods of time, K. H. Logan, soil corrosion expert of the National Bureau of Standards, Washington, reports that "while most of these non-ferrous materials corrode less rapidly than steel in most soils, I cannot say that any one material appears to be superior to all others under all conditions."

Mr. Logan pointed out that to obtain the best results, the pipe line owner should determine exactly what soil conditions exist in the territory through which he has to run his line and then pick the pipe material that will most economically meet these requirements.

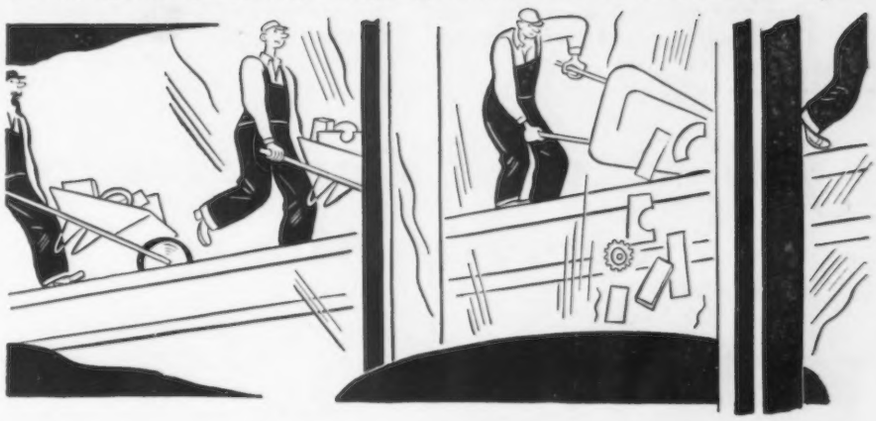
In all, about 9000 specimens were buried, 2500 of which are still in the ground. Since all the specimens have been removed from about 25 of the test sites covering a wide variety of soil conditions, Mr. Logan believes that a report is warranted at this time.

"Unfortunately," it was stated, "the rates of corrosion of each material differ so greatly under different conditions that generalizations are of little practical value." To illustrate this point, it was said that "in many soils a light-weight ferrous material will last so long that the use of any more durable material cannot be justified. Under other conditions, if continuous trouble free service is to be insured, it will be necessary to employ a non-ferrous material.

"Soils high in soluble salts which are destructive to steel appear to cause the formation of corrosion products which then protect lead from serious corrosion. Yet, on the other hand, in a few soils, lead pits very badly and there is but very little evidence of the formation of a protective corrosion film.

"In soils containing sulfides and sulfates, copper and high copper alloys lose weight rather rapidly and the protection rendered by the corrosion products is imperfect. Fortunately the corrosion is nearly uniform. Brasses high in zinc show serious dezincification within

THE CHARGE OF THE CUPOLA BRIGADE!



"Theirs not to reason why"—if you want to pay men with wheelbarrows to charge a cupola, there's nothing in the world to stop you. But it will cost you plenty. So will some of the other old-fashioned methods.

A P&H cupola-charging hoist can do more work and cost you far less. As a trailing cage unit, for example, with motor-driven trolley, this installation is fast, efficient and economical in cupola charging service.

P&H material handling engineers have a wealth of experience to help you with your problems. If they can't show you a way to save money, they'll frankly tell you so. Why not call one in? Or ask us to send you Bulletin RH-2.

Safety catches, which ride above I-beam flange, make it impossible to derail this unit should a heavy jolt occur. It's 100% safe.

HARNISCHFEGER CORPORATION
Established 1884
4401 West National Avenue Milwaukee, Wisconsin

P&H ELECTRIC CRANES ELECTRIC HOISTS

a few years in certain soils. In most soils, the corrosion of copper and brass seems to be nearly proportional to the duration of the exposure.

"In a few soils aluminum and two of its alloys were unsatisfactory.

"A curious difference in the electrolytic behavior of materials was also brought out in these tests. In some cases in which dissimilar materials were interconnected, serious acceleration of the corrosion of the anodic material or alloy took place while under other conditions no galvanic action was indicated.

"Two classes of non-metallic pipe, one made of wood fiber and the other a mixture of portland cement and asbestos fiber, did not make a perfect score in several of the soils."

$20,000,000 For New York Workers

MORE than $20,000,000 has been collected in the first nine months of 1936 under the New York State Unemployment Insurance Law in conformity with the unemployment insurance section of the Federal Social Security Act, according to Elmer F. Andrews, industrial commissioner. This sum is for the benefit of New York state workers, 2,500,000 of whom are covered by the law. No part of this amount has been deducted from wages. By Jan. 1, 1938, approximately $90,000,000 will have been so collected for payment of unemployment benefits.

To show the operation of the law, the Commissioner has reported on a worker receiving $20 a week. Under the Unemployment Insurance Law his employer in 1936 is paying 20c. a week additional into the State unemployment insurance fund. By Dec. 31, 1936, the employer will have paid a total of $10.40; in 1937, $20.80, and annually thereafter, $31.20. Add to this the employer's payment under the old age benefit section of the Social Security Act the sum of $10.40 which starts Jan. 1, 1937. In 1937 the employer will be paying, for unemployment insurance and old age benefits, $31.20 and, in 1938, $41.60, or more than two weeks' wages, while the worker will be paying in 1938, $10.40. At the peak in 1949, the employee will be saving $31.20 for old age benefit payments while his employer will be paying into funds for old age benefits and unemployment insurance $62.40, twice the amount paid by the employee. The total security payment for the $20-a-week worker will be $93.60 per year.

These figures are based on a $20-a-week wage merely to simplify them. Currently, wage earners in New York state are receiving an average higher than $20 a week, the average being $25.18 per week for September. The higher the wages received by a worker, the more he will receive up to prescribed maximums.

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specify MODERN
Chain Drives

Chain drives gain increasing acceptance year by year as a means to profitable machine performance. The field of application for this positive and efficient power transmission medium has constantly widened, because modern chain drives have kept in step with improved manufacturing methods and materials.

Whitney Chain Drives are recognized as outstanding in performance. They have strength for the most severe operating conditions and a high resistance to wear, which helps to maintain original accuracy and smoothness of operation.

Whitney Chain Drives are specified by leading designers, manufacturers and plant engineers. Their inherent characteristics allow a freedom of design which is unequalled by other types of drives. Whitney engineers can offer valuable suggestions on your power transmission problems. Write today for further information.

The Whitney Chain & Mfg. Co., Hartford. Conn.

Government Publishes Trade Mark Study

VIGILANCE in the protection of the good will in American-made goods by the timely requirement of trade mark and patent rights and vigorous repression of all forms of unfair competition are necessary in order to combat the unscrupulous efforts of traders who derive an unjust profit through the adoption of unfair trade practices not only in American markets, but throughout the world, according to a study made by James L. Brown, Division of Commercial Laws, Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington.

It was stated that trade marks, labels and other identifying media occupy a place of more importance in merchandising today than at any time in the past, and the pub-

lication devotes a chapter to discussion of this topic.

Design piracy, patents for industrial products and processes, and unfair competition in its numerous forms, including monopolies in restraint of trade, are all discussed in the study. It also includes texts of pertinent treaties and conventions and a summary of the trade mark laws of 63 foreign countries.

Intended to acquaint the American manufacturer and trader with those industrial property matters which experience has proved to be necessary in the protection of established and potential markets for their goods, this 184-page handbook may be purchased for 20c. at the Department of Commerce.

..TRADE NOTES..

Chain Belt Co., Milwaukee, announces that its Portland, Ore., office has been moved to 112-118 S. W. 1st Avenue. The move was made in order to carry larger stocks and better serve the territory.

George P. Reintjes Co., 2517 to 2519 Jefferson Street, Kansas City, has appointed the Moorland Co., 409 to 411 East Archer Street, Tulsa, Okla., as sales representative for its line of furnace walls and arches.

American Steel Foundries, Inc., Chicago, now owns Eastern Steel Castings Co., Newark, and has been operating that plant since Oct. 1.

Lewis Machine Co. has moved to 3441 East 76th Street, Cleveland.

Easton Car & Construction Co., Easton, Pa., has appointed H. B. Fuller Equipment Co. as Cleveland agent.

Magnetic Mfg. Co., 675 South 28th Street, Milwaukee, has changed name to Stearns Magnetic Mfg. Co. No change is being made in corporate structure, management or location.

Columbia Tool Steel Co., Chicago, is preparing to move its Milwaukee office and warehouse from 169 South Second Street, to new and larger quarters at 441 North Sixth Street. Carl F. Scheid is district sales manager. The branch was established in 1906 under the management of the late Adolph J. Scheid, father of the present manager.

Moeller Instrument Co., Inc., formerly of Brooklyn, has moved to new factory at 132nd Street and 89th Avenue, Richmond Hill, New York.

Chicago Pneumatic Tool Co., 6 East 44th Street, New York, has appointed W. C. Straub, formerly manager of the New York branch office, as assistant to the executive vice-president. A. D. Stem has been made manager of the New York office to succeed Mr. Straub.

William A. Kelley, representing the Nickel & Chromium Products Corp. and the Connecticut Electro Plating Machine Co., has opened headquarters at 19 East Ohio Street, Chicago, where a complete line of plating equipment and supplies will be carried.

Smart Safety Engineering Corp., Detroit, manufacturer of armored safety equipment for police and governmental agencies, has made a new offering of stock amounting to 100,000 Class A shares at $1 and 50,000 Class B no par. Proceeds of the offering will be used for factory construction and expansion of the company's business. The company was organized in Michigan in 1935 and owns patents on gun ports, bullet-proof counter equipment, hood and radiator armor and other bullet-proof devices. Carroll M. Smart is president, and T. G. Smart, vice-president.

BLISS & LAUGHLIN, INC. COLD DRAWN STEEL

SHAFTING

Cold Drawn
Ground and Polished
Drawn, Ground, Polished
Turned, Ground, Polished

THE quality of B & L Cold Finished Shafting is brought out in the making. Machines of modern design, men of mature experience and methods of close laboratory control, coordinate in a single purpose: To produce a prime material that measures up to the B & L standards of uniformity, straightness, concentricity and size tolerances. Manufacturers who build precision into their products depend upon B & L Steel Shafting for accuracy and economy in fabrication, for fine running qualities and long service life in the finished equipment. Refer your shafting problems to B & L engineers. Descriptive folder sent on request.

Cold Drawn Bars • Shafting • Screw Stock • Alloy Steels

BLISS & LAUGHLIN, INC.

HARVEY, ILL. *Sales Offices in all Principal Cities* BUFFALO, N.Y.

Executive Predicts Booming Auto Market

IN one section of a recent address, C. E. Wilson, vice-president of General Motors Corp., stated that "whereas prior to 1933 the ratio of increased automobile purchases to increased national income was an increase of 35 per cent in automobile business to each $10,000,000,000 of increase in the national income, during the years 1933, 1934 and 1935, this rate shows approximately a 35 per cent increase for each $5,000,000,000 increase in national income.

"We believe this increase in the purchasing of automobiles is due to the greater value of the cars since the depression. The automobile industry has made every effort to build a better and improved product, and sell it for less. In 1929 the average retail value of a motor car was $895, while in 1935 the average retail value was $690 for a very much improved product. During this period the price of the average car has been decreased 23 per cent, and the weight of the average car has been increased 6 per cent. This gives a decrease in cost per pound of the car of more than 25 per cent. At the same time the appearance, performance and utility of the car have been greatly improved. We believe this is the reason the public is willing to spend a bigger percentage of its income for new cars.

"A 10 per cent increase in the present national income should increase the value of new cars purchased by 20 per cent, according to the old trend curves, and should increase the value about 35 to 40 per cent according to the 1933 to 1935 trend. When the statistics of the automobile business are studied, it is difficult to keep from getting optimistic about the future of the business.

"In talking over the future of the industry with R. H. Grant, who is vice-president in charge of distribution for General Motors, he made a statement which I am going to quote today:

"'It is my opinion that before reaching the saturation point the American public can use 35,000,000 automobiles. This compares with the total registration of cars and trucks of 25,550,713, as of Dec. 31, 1935. To make this possible, however, the following three matters will need a large amount of attention in the public interest:

"'(1) The question of taxation on automobile owners—both as to direct taxes on cars and tax on gasoline—and other indirect taxes, is very important. It is my opinion that any further increase in taxes will tend to defeat the maximum use of automobiles.

"'(2) It is important that legislation pertaining to the use and operation of automobiles is intelligent. Legislation that is too drastic can be a deterrent to the maximum use of automobiles.

"'(3) The proper number of roads—scientifically built to avoid undue congestion—is another factor of very great importance in determining the number of cars

SHEET and strip producers, as well as the executives and office workers who use desks and tables, look with pleasure upon the accomplishments of the modern steel furniture makers. In this instance the handsome young lady is taking dictation at one of the Globe-Wernicke Co.'s new "Advance" steel desks, a line introduced to the public a few weeks ago.

Do YOU know the Answers?

Count 20 points each for the correct answers to the following questions. Can you score 80? Don't look now, but the answers are on page 170.

1. Annie Oakley was famous for her:
   Tap dancing — Attacks on the saloon
   Accuracy in shooting — Beautiful voice

2. The first electric car was designed in:
   Paris — Bournemouth, England
   Detroit — Des Moines, Iowa

3. What is the size range of Bundyweld Tubing?

4. A cachelot is a:
   Roman chariot — Sea-going mammal
   18th century band instrument — Antarctic duck

5. The Guano Islands off South America are famous as:
   A pirates' hangout — A naval coaling station
   A source of fertilizer — Home of fine cigars

The Answer to Your Tubing Problem is
BUNDY TUBING
BUNDY TUBING CO. . . DETROIT

the American public will finally use.'

"Mr. Grant's forecast assumes a continuation of the American system of production—not restriction—and his firm belief that the national income of this great country of ours will again reach or exceed the prosperity figures of 1925 to 1929. This is certainly not an unreasonable expectation."

Carnegie-Illinois Employee Groups Present United Front for Wage Advances

LEADERS of the two Carnegie-Illinois Steel Corp.'s employee general committees, one representing 25,000 sheet and tin workers and the other over 50,000 steel mill workers, are meeting in Pittsburgh this week with management officials to take up the question of a consolidation of the two groups into a small powerful bargaining agency.

According to employees' representatives, should this proposed small central committee be recognized, it will attempt to get a positive reply on wage questions and other issues, and, in addition, present a united front in warding off attempts of the John L. Lewis Committee on Industrial Organization to replace the employee representation groups.

Meanwhile, employee representatives at the various plants of the Carnegie-Illinois Corp. are ratifying amendments to the by-laws of the plan of employee representation. One major amendment concerns the rights of employee representatives to arbitrate matters on which no agreement can be reached at joint conferences between employees and management.

The section pertaining to arbitration, which has already been ratified by eight out of nine steel works and is up for approval at all sheet and tin plate plants, is as follows:

"If the president of the company and the majority of the employee members of the Pittsburgh district general council shall fail to effect the satisfactory settlement, they may submit the matter to arbitration. They shall proceed at once to select an impartial and disinterested arbitrator. If they cannot agree upon an arbitrator, then the employee members of the council shall select one such arbitrator and the president shall choose another, and if these two shall agree, their decision shall be final and binding. If they do not agree within 30 days, then the president of the company and the employee representatives of the council shall select, by mutual agreement, within 15 days a third arbitrator and the decision of the majority of these three arbitrators shall be final and binding to all parties concerned."

EC&M Magnet Users say—

"New Magnets handle 25 to 55% more material than old ones."

Bigger loads mean better profits. By replacing old magnets with the latest-design EC&M Lifting Magnet, Steel Mills, Pipe Foundries, Scrap Yards, etc. located throughout the prominent industrial centers, are moving their products and raw materials more quickly . . . and at a considerably lower cost.

Reports from these users say—"10 hours handling now done in 7 hrs."—"loads 3 cars while old magnet loads 2"—"Shows average of 55% greater lifting capacity compared with our old magnets." A trade-in allowance will be made on your old magnet against the purchase price of a new magnet. Investigate your material handling costs today.

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Illustrates and describes the advantages of these efficient EC&M Magnets for practically every kind of material handling . . . over 30 illustrations of magnets at work. Ask for your copy now.

EC&M AUTOMATIC— DISCHARGE CONTROLLER

Cuts down the time between magnet trips. No delays . . . no scattered loads. Gives a clean, quick release of the load automatically. Compact, convenient Master Switch for the crane operator. Faster action, more trips, better profits!

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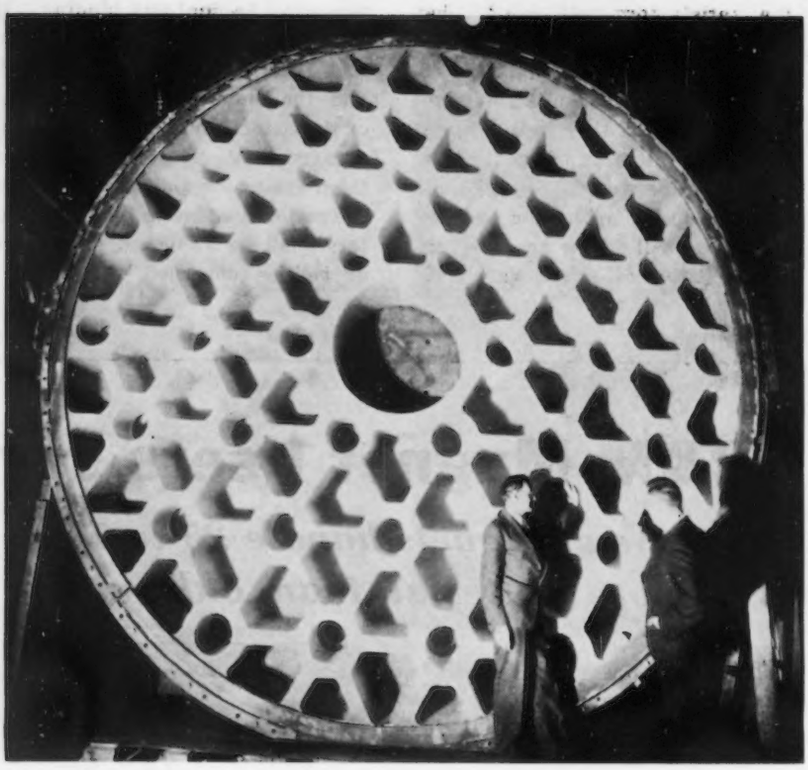
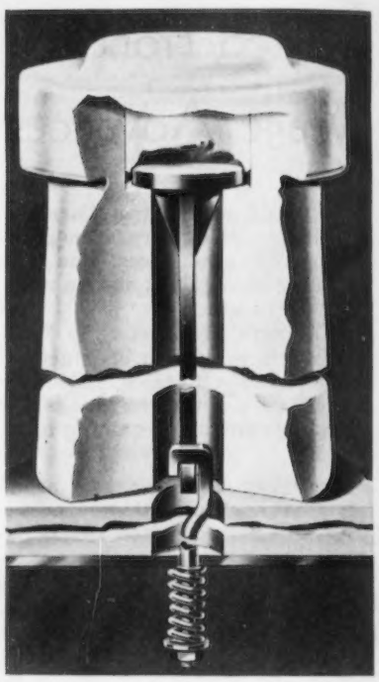


Chromium-Nickel Steel Core Anchors Used in Casting 200-In. Telescope Disk

CHROMIUM - NICKEL steel was used advantageously by the Corning Glass Works in molding the glass reflector for the 200-in. telescope for the California Institute of Technology. The mold included a large number of cores which had to be anchored so securely that they would not rise during the casting process.

As shown in the illustration, the mirror or disk was ribbed at its back; this was to hold the mirror to the minimum weight and still provide the rigidity necessary to maintain its figure of curvature to a millionth part of an inch. The mold to form the geometric pattern of hollows in the back of the glass disk required 114 cores varying in height from 16 to 20 in. When immersed in 26 in. of molten glass these cores, which are made of a light-weight insulating brick, tend to become buoyed up like corks in water. It was to hold them in place that anchors made of chromium nickel steel were provided.

As shown, these anchors have a stem of rectangular section and a circular flange at the top. A hook engaged the lower section



Cut-away section illustrating method of holding cores in place against the mold bottom by means of chromium-nickel steel anchors. (Photos and data by courtesy of the Electro-Metallurgical Co., New York.)

end of the stem and completed the connection with the bed plate of the mold below. The circular flange at the top of each anchor had a sectional area of slightly more than 1 sq. in. and was designed to carry a load of 300 lb. without appreciable creep or stretch for a period of two weeks at a temperature of 1525 deg. F.

In addition to the stresses induced in the anchors from the buoying effect of the cores, the length of the annealing operation

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Industrial Screens for all purposes.
Cane and Machinery Guards.
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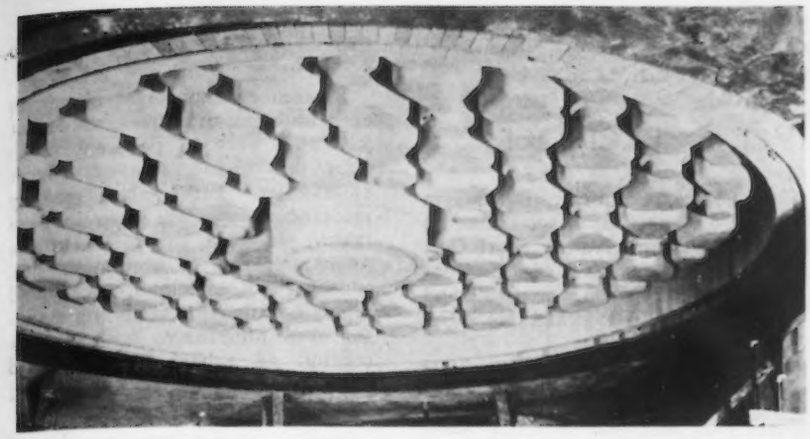

Mold for 200-in. disk, showing some of the 114 ceramic cores.

at which these anchors were subjected to red-heat temperatures was a most important factor. The mold was first heated to about 1800 deg. F., and 6 hr. was required to pour 20 tons of molten glass at a temperature slightly less than 2800 deg. F. The mold and its contents were then held at 2400 deg. F. for 10 hr., followed by slow cooling to a dull red heat of 1200 deg. F. Finally, the whole unit was placed in an annealing oven and allowed to cool only a few degrees a day for 11 months. Notwithstanding these severe conditions, when removed from the mold, the chromium-nickel steel anchors were not discolored and were still of the original dimensions.

New Automatic Welders Operate at High-Speed

IN new automatic welding machines, developed by Harnischfeger Corp., Milwaukee, elimination of the hand-operated electrode holder makes it possible to use a higher current with welding heats as much as 60 per cent higher than standard practice, thereby increasing the speed of production. Operation is by remote control.

Up to 50 standard welding rods are loaded in a magazine and are fed automatically to the welding position. As one electrode is consumed, the butt is ejected and a new, full-length rod is fed into place. The renewing operation takes less than a second. During this feeding operation, the work table stops, and starts again automatically as the new electrode makes the electric contact. The action is so swift that no break in the welded bead is evident. The arc length is automatically regulated at a constant point during the welding operation. Though the working surface be irregular, there is said to be no apparent variation in the penetration or appearance of the bead.

This new machine is adaptable to flat work of any length, to circular pieces and, with pantograph attachment, to work of any shape. It may be used on lathes, planers, rotating tables, boring mills and with wall cranes, for welding long girders, etc.

[har'mo-ny, *n.*; . . . The just adaptation of parts to each other in any system or combination of things . . .]

● Old Noah Webster was right and harmony in your finishing operations means just that . . . the right buff combined with the right composition correctly applied to your work . . . makes for sweet harmony in your finishing operations.

Even the very best buff unless coupled with a composition that is "right" for the job will not produce the desired result—**better buffing.** The same holds true for the best composition and an inferior buff.

Udylite manufactures a complete line of buffs—highest quality buffs . . . Udylite has a composition for every purpose . . . Udylite maintains a service staff qualified by knowledge and experience to assist you in determining the proper combination best suited to your purpose.

The right buff . . . the right composition . . . Udylite Buffing Service . . . add up to one thing—RESULTS. And, that's "sweet music" in any man's language. May we help you?

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Pig Iron Output in October Rose 6 Per Cent Over September

ESTIMATED production of coke pig iron in October totaled 2,992,968 gross tons, compared with 2,730,293 in September. The daily rate in October, at 96,547 tons, was 6 per cent above the 91,010 tons in September, and was the highest since June, 1930, when it was 97,804 tons. There was a gain of five furnaces, 160 being in blast on Nov. 1, against 155 on Oct. 1.

Among the furnaces blown in during the month were: One Eliza, Jones & Laughlin Steel Corp.; one Cambria, Bethlehem Steel Co.; one Otis Steel Co. unit; Anna, Struthers Iron & Steel Co.; two Ensley furnaces of the Tennessee Coal, Iron & Railroad Co., and one Woodward Iron Co. furnace.

Furnaces blown out or banked included one Madeline, Inland Steel Co., and one Weirton Steel Co. furnace.

Actual production figures and complete tabulations will be published next week.

Exports of Lead, Aluminum, Copper And Refractories Decline — Zinc Exports Rise

DOWN five and one-half per cent, exports of lead from the United States in September were valued at $126,696, the August figure having been $134,449, according to the Metals and Minerals Division of the Department of Commerce.

Easily the principal item in the month's trade, shipments of lead in pigs, bars, etc., valued at $62,215 were $10,161 under the August trade of $72,376. Shipments of "other lead manufactures" at $16,811 were $8,931 less than August's $25,742, but the trade in solder increased by $3,098 to a total of $17,692, while exports of babbitt metal rose $10,421 to $29,542.

September exports of aluminum ores and manufactures, valued at $270,187, were 17 per cent ($53,132) less than those of August ($325,319). Information recently released shows this drop to have taken place in the trade in the primary forms of aluminum—ore, concentrates, and ingots, scrap and alloys—while the trade in manufactured aluminum, with the exception of tubes, moldings, and castings, showed a very gratifying upward tendency.

During September the value of exports of bauxite concentrates from the United States declined to only $116,785, or $44,903 under the August figure of $161,688, while the trade in bauxite ore fell off $20,886 or to $43,765 from the preceding month's total of $64,651. On the other hand, exports of plate, sheet, bar, strip and rod aluminum rose $14,936 to total $28,722 worth, and the trade in "other manufactures of aluminum" was $11,227 above the August figure of $46,824 worth.

Exports of copper and of brass and bronze and their manufactures also registered declines. September exports were valued at $4,376,077 which was $177,111, or 3.9 per cent below the August level. The drop in the value of shipments of brass and bronze was even more marked, being $40,858, or 9.5 per cent.

Except for the single decline registered by shipments of refined copper in ingots, bars and similar forms—a drop of $461,412 which reduced the value of exports of this item to $3,552,390—the trade in copper and copper manufactures showed gains consistently. The value of the trade in copper rods, for example, rose $222,021 to $489,819 in September, while shipments of bare copper wire, amounting to $64,524, were greater than in August by $19,932. Exports of old and scrap copper were valued at $150,805 in September, an increase of $917 over the August trade.

Shipments of refractory materials to foreign buyers in September amounted to $273,725, which was 16.5 per cent smaller than the August total of $328,517. A decline in the trade in magnesite brick and shapes amounting to $82,990 more than accounted for the loss noted.

Shipments of high temperature and refractory cements rose from

"HERCULES" RED-STRAND REG. U.S. PAT. OFF. WIRE ROPE

Furnished in Flattened Strand, Round Strand, Preformed, Steel Clad and Non-Rotating constructions.

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$16,591 to $23,918. Sales of fire clay bricks and shapes also increased by a substantial margin.

At $111,027, exports of zinc in September were 2.5 per cent higher than in August when shipments had been valued at $108,237.

Shipments of zinc abroad in the form of sheets, strips and other rolled forms were valued at $63,337. Similar shipments in August were valued at $9,968. The trade in zinc dust, however, amounted to only $20,931, $10,481 less than in August. Exports of "other zinc manufactures" rose to a value of $26,001 from $21,938, an increase of $4,063. The trade in zinc concentrates and dross and in zinc in slabs, plates or blocks was light.

How Shop Foremen Can Cooperate With The Sales Department

ACTIVE cooperation between the foremen and the sales department of a manufacturing organization was emphasized by Charles M. Reesey, advertising manager, Cincinnati Milling Machine & Cincinnati Grinders, Inc., in a recent brochure entitled "The Most Vital Thing Today in a Foreman's Job," prepared for the Dayton Foremen's Club.

The success of the entire organization depends upon the efforts of those responsible for the manufacturing and those responsible for sales, he pointed out. Basic understanding of each other's work makes possible the cooperation which spells success.

By maintaining high quality of the product, the foremen assist the sales department materially. Most lines of business depend upon repeat orders. Repeat orders depend upon satisfied customers. Satisfied customers are maintained if the goods which they purchase are continually of a dependable quality. Naturally, it is the salesman's job to present the manufacturer's claims for quality. He is greatly embarrassed and disheartened if these claims are not justified by the product. Regardless of the inspectors, the foreman has more to do with the quality of the product than any other individual. The foreman has to control the human element, which is variable. All other factors can be standardized. The salesman can do better work if he knows that the quality of his goods is dependable.

Foremen can help the sales department a great deal by maintaining promised deliveries. Many sales depend upon a company's reputation for maintaining deliveries. After a company has promised a delivery date, every effort should be made to live up to the promise. This requires skillful management within the foreman's department. Failure to keep delivery dates without a very good reason hurts the foreman as well as the salesman.

By helping maintain adequate customer service, the foremen can also render much assistance. Future sales may depend upon present service. Rush orders for repair parts, or requests for sending competent mechanics into the field may be received. This often requires tactful management or even sacrifice on the part of the foreman, and yet it is a company problem which the foreman must keep in mind and meet squarely.

In many instances the foreman can assist in promoting sales. On many occasions potential customers visit various departments in the factory.

To engage in active sales promotion, the foremen and the men working for them should be familiar with the features and talking points of the product. The customer is often anxious to get the foremen's point of view toward the construction and actual use of the product. By answering all questions thoroughly and pointing out interesting facts, the foreman can do much to assist in selling the product. Especially is this true with reference to accuracy of construction and high grade materials.

An attitude of pride in workmanship is especially impressive to the customer. Good housekeeping within a department is a valuable help.

If foremen will themselves take cognizance of the importance of cooperating closely with the sales department and instruct and caution the workmen of this responsibility, a greater volume of business could undoubtedly be secured by the sales department.

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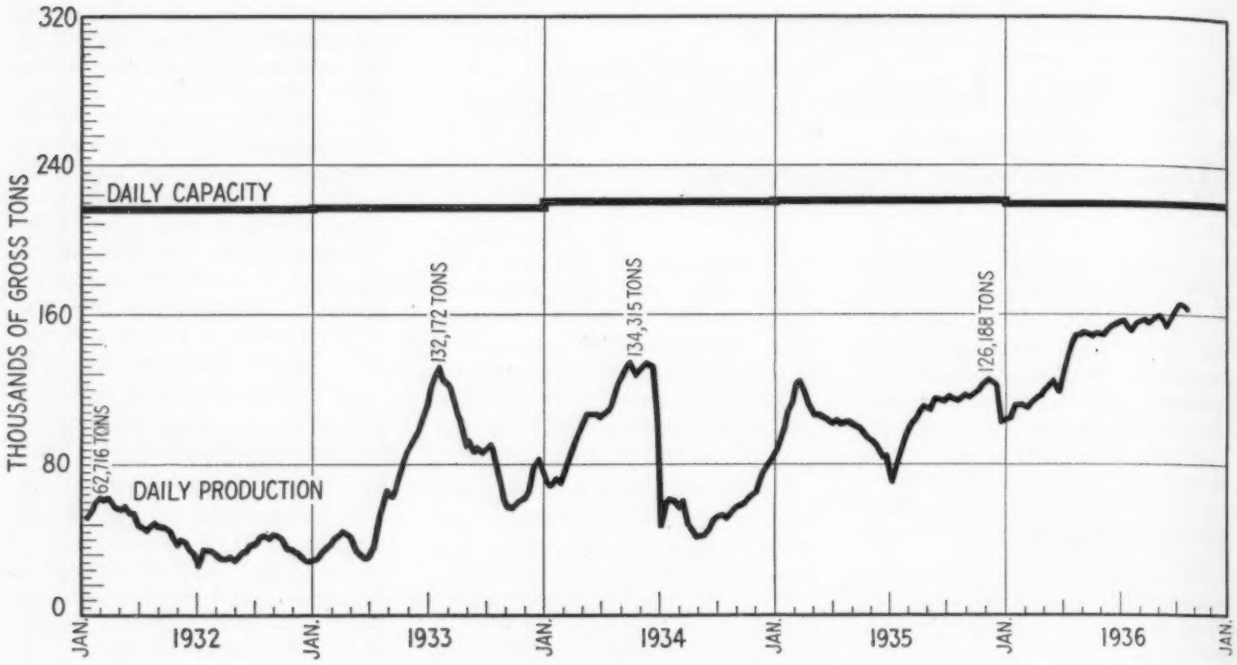
STEEL INGOT PRODUCTION

Daily Tonnage of Bessemer and Open-Hearth Steel Ingots Produced by Weeks, 1932-1936

Current Week	Last Week	Weeks Ended Nov. 9, 1935	Nov. 10, 1934	Nov. 11, 1933	Nov. 12, 1932
163,507	162,410	116,225	58,350	56,336	42,171



Figures for the current week are not indicated on the chart until the following week.

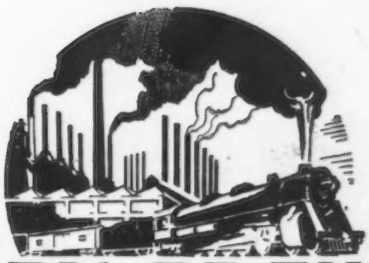
STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

District	Current Week	Last Week	Weeks Ended Oct. 10, 1936	Nov. 9, 1935	Nov. 10, 1934
Pittsburgh	71.0	70.0	76.0	44.0	18.0
Chicago	76.0	75.0	76.0	56.0	30.0
Valleys	75.0	76.0	79.0	62.0	26.0
Philadelphia	55.5	55.5	55.5	40.0	24.0
Cleveland	84.0	84.0	80.0	69.0	39.0
Buffalo	84.0	78.0	80.0	33.0	27.0
Wheeling	93.0	93.0	97.0	81.0	36.0
Southern	62.0	58.0	60.5	46.0	25.0
Ohio River	95.0	95.0	94.0	85.0	35.0
Western	59.0	59.0	59.0	35.0	15.0
St. Louis	63.0	72.0	72.5	59.0	25.0
Detroit	100.0	100.0	95.0	90.0	53.0
Eastern	90.0	90.0	90.0	35.0	20.0
Aggregate	74.5	74.0	75.5	52.5	26.5
Average Year to Date	67.7	65.5	64.9	47.2	38.0

Weekly Booking of Construction Steel

From THE IRON AGE

	Week Ended Nov. 2, 1936	Oct. 27, 1936	Oct. 6, 1936	Nov. 5, 1935	Year to Date 1936	1935
Fabricated structural steel awards	15,850	9,300	13,900	23,100	894,230	658,510
Fabricated plate awards	1,110	9,760	2,625	1,255	191,565	124,455
Steel sheet piling awards	1,875	1,575	0	1,995	50,140	57,405
Reinforcing bar awards	2,625	7,145	4,555	1,510	294,525	277,200
Total Lettings of Construction Steel	21,460	27,780	21,080	27,860	1,430,460	1,117,570



. . . SUMMARY OF THE WEEK. . . .

. . . Ingot production recovers some of ground recently lost.

o o o

. . . Pig iron output gains 6 per cent over September.

o o o

. . . Automobile buying increases; steel scrap up 25c. at Chicago.

A SLIGHT lifting of the rate of steel ingot production to 74½ per cent; an October increase of 6 per cent in pig iron output; a stronger scrap market, with an advance of 25c. in heavy melting steel at Chicago; a stepping up of automobile assemblies to more than 71,000 a week, with further gains in immediate prospect; an advance of $1 a ton in pig iron prices by an Eastern producer, which may be followed shortly by competitors, and more active buying of some steel products, are possible indicators that pre-election uncertainty may soon be displaced by a renewed forward movement.

Steel production has gained moderately at Pittsburgh and Chicago. Several of the larger companies are operating at fractionally higher rates than last week. The tapering of new business, principally in the heavier products, which had affected schedules at some mills, apparently has been checked. Moreover, this loss of tonnage has been offset to a considerable extent by larger releases of bars, sheets, strip and wire by the automobile makers.

Pig iron production in October, as estimated by THE IRON AGE from reports on Monday, totaled 2,992,968 gross tons, compared with 2,730,293 tons in September, the daily rate having been 96,547 tons against 91,010 tons in the previous month, a gain of a little over 6 per cent. The daily rate was the highest since June, 1930, when it was 97,804 tons. Furnaces in blast Nov. 1 totaled 169, a gain of five since Oct. 1.

THE first announcement of expected increases in pig iron prices comes from a New England maker whose competition has been largely foreign iron. The shortage of pig iron in Europe has restricted exports to this country, and Atlantic Coast consumers will be more dependent on domestic supplies, which are none too plentiful. In England trading in pig iron has virtually been suspended because of scarcity. The New England pig iron maker, which operates auxiliary by-product ovens, is said to find coke more profitable than pig iron at the prices which have prevailed for iron. Central district furnaces, including some of the steel companies that cater to merchant trade, are less anxious to sell pig iron, which they need for steel making, and a general advance in prices, which may amount to as much as $2 by the end of the year, is in prospect. The $1 advance announced in New England is limited to deliveries by Dec. 31.

The expectation of steel companies that blast furnace production will be continued at a high rate throughout the winter is borne out by the heavy movement of Lake Superior ore, which to Nov. 1 totaled 41,063,872 gross tons, indicating receipts for the season of 46,000,000 tons, by far the largest since 1930.

The scrap market, though not active as to sales, has taken on a firmer tone in the expectation that no sharp falling off in steel production will occur this year. The advance of 25c at Chicago brings THE IRON AGE composite price to $16.58, restoring a third of the loss of the past few weeks.

TWO divisions of steel consumers, the railroads and the automobile industry, show considerable promise for the remainder of the year. The automobile industry will have the more immediate effect, as its orders are now showing an increase. With motor car output for last week estimated at 71,095, further gains will come as Ford Motor Co. swings into heavier assemblies.

Indications of substantial purchases of rails and equipment by the railroads are multiplying. The Ensley (Alabama) rail mill has started a production run that probably will last five months on accumulated orders. Other rail buying in substantial amounts is expected within the next few weeks. The Burlington road may buy 3250 freight cars and five locomotives, the Union Pacific 10 locomotives, the Western Pacific 10 locomotives and the New York may order 60 engines instead of the 50 recently inquired for. A large Eastern carrier is considering a major car program.

Except for the construction industry, in which activity may revive after election, the outlook for moderately good business during the remainder of the year is promising. A wage advance followed by higher prices for the first quarter would undoubtedly induce a fresh wave of forward buying.

. . . PITTSBURGH . . .

. . . Ingot production moves up to 71 per cent of capacity.

o o o

. . . Decline in buying of heavy products has apparently been checked.

o o o

. . . Some improvement in orders noted in several lines.

PITTSBURGH, Nov. 2.—After dropping for two weeks, ingot output in the Pittsburgh district has moved up one point this week to 71 per cent of capacity. The Wheeling district remains unchanged at 93 per cent of capacity.

While some Eastern pig iron producers have raised prices, producers in this district have as yet not followed suit. It is the general opinion in this territory that some form of increase will take place before the end of the year and will affect tonnages for first quarter delivery, as all major consumers have placed contracts covering their fourth quarter requirements. In fact, the situation with regard to pig iron supplies in this area is tight, since not only are all merchant stacks shipping as much as they can produce, but steel mills catering to the merchant trade are having all they can do to supply this type of customer and their own steel-making departments.

Though demand for heavy plates and shapes has been receding at a fast rate recently, evidence has appeared in the past few days that the decline has been checked. Specifications for plates, while not much better than a week ago, nevertheless show some improvement, while miscellaneous bookings of small shapes have shown an increase. Bethlehem Steel Co. will furnish 2550 tons of fabricated material for extensions to Wheeling Steel Corp.'s buildings at Yorkville, Ohio. Jones & Laughlin Steel Corp. will fabricate 630 tons of plates and shapes for a building addition to the Gordon Building Co., Long Island City. Outstanding inquiry of the week is for 4100 tons of plates and shapes for Florida Keys bridges in Monroe County, Fla.

Demand for hot-rolled bars has been holding its own and shows a slight improvement over a week ago. While backlogs have been reduced, there still remains a heavy volume of unfilled orders. There has been an increase in new business for cold-finished material. Orders for strip steel are flowing in freely while bookings for sheets from widely diversified sources have been better than the incoming rate of a week ago.

Tin plate production continues its unseasonably high rate of 93 per cent and there is no evidence that this figure will change materially within the next two or three weeks. Additional 1937 packers' can specifications have been received and general line can business has shown improvement.

Specifications for manufacturers' wire have shown a decided improvement in the last week and there have been quite a few orders entered for merchant wire items at the new prices. Consumption of wire products is good and customers are exerting pressure for delivery.

Plates and Shapes

The rapid decline in demand for heavy plates and shapes, which has occurred over the past several weeks, has for the present, at least, come to an end. Bookings for heavy plates have been slightly better over the past few days and demand for miscellaneous small shapes and plates has shown an increase. Outstanding inquiry is for 4100 tons of fabricated material for Florida Keys bridges, Monroe County, Fla. American Bridge Co. has received two awards covering highway bridges, one at Staten Island and one at Blairsville, Pa., which aggregate 760 tons. Jones & Laughlin Steel Corp. is furnishing 630 tons of fabricated plates and shapes for a building addition to the Gordon Building Co., Long Island City, N. Y.

Pig Iron

Both production and consumption of pig iron are moving along at a high rate. Since most customers have placed contracts to the end of the year, new orders have dropped off considerably. In some cases consumers who already have contracts placed are making fresh purchases running from 50 to 100 tons, feeling that their original commitments were not large enough. Merchant furnaces in this district are operating at capacity, with little likelihood of a change before December. Should a price increase materialize, as is expected, the normal dull year-end season will not take place this year. Meanwhile, there are no large stocks of iron at either producers' or customers' plants.

Semi-Finished Steel

Producers are completing final shipment of tonnages taken at third quarter prices. While some customers have stocked up quite heavily in order to take advantage of the lower price, nevertheless this material will be fabricated quickly owing to heavy consumption by non-integrated mills' customers. Bookings at the new prices are no better than a week ago and are much below the rate of last month. The completion of orders on the books will give many of the larger mills a breathing spell as their own stocks of slabs and billets are either non-existent or negligible.

Bolts, Nuts and Rivets

New business during the last half of October was in better volume than in the first half. New bookings over the past week are not only on a par with the week before, but show a slight improvement. Miscellaneous demand again shows a little better activity and current production on recent railroad tonnages for repair programs is enabling producers to maintain a fair operating rate. Specifications from automobile manufacturers are expected to improve somewhat during November.

Bars

Production of unfilled orders is still the major interest of local producers, and as a result backlogs have eased off further. The reduc-

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous; Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Nov. 2, 1936	Oct. 27, 1936	Oct. 6, 1936	Nov. 5, 1935
Rails, heavy, at mill	$36.37½	$36.37½	$36.37½	$36.37½
Light rails, Pittsburgh	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh	32.00	32.00	32.00	27.00
Sheet bars, Pittsburgh	32.00	32.00	32.00	28.00
Slabs, Pittsburgh	32.00	32.00	32.00	27.00
Forging billets, Pittsburgh	39.00	39.00	39.00	35.00
Wire rods, Nos. 4 and 5, P'gh	40.00	40.00	40.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.80	1.70

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.05	2.05	2.05	1.85
Bars, Chicago	2.10	2.10	2.10	1.90
Bars, Cleveland	2.10	2.10	2.10	1.90
Bars, New York	2.40	2.40	2.40	2.20
Plates, Pittsburgh	1.90	1.90	1.90	1.80
Plates, Chicago	1.95	1.95	1.95	1.85
Plates, New York	2.19	2.19	2.19	2.09
Structural shapes, Pittsburgh	1.90	1.90	1.90	1.80
Structural shapes, Chicago	1.95	1.95	1.95	1.85
Structural shapes, New York	2.16¼	2.16¼	2.16¼	2.06¼
Cold-finished bars, Pittsburgh	2.35	2.35	2.35	1.95
Hot-rolled strips, Pittsburgh	1.95	1.95	1.95	1.85
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.60
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.60	2.60	2.60	2.40
Hot-rolled annealed sheets, No. 24, Gary	2.70	2.70	2.70	2.50
Sheets, galv., No. 24, P'gh	3.20	3.20	3.20	3.10
Sheets, galv., No. 24, Gary	3.30	3.30	3.30	3.20
Hot-rolled sheets, No. 10, Pittsburgh	1.95	1.95	1.95	1.85
Hot-rolled sheets, No. 10, Gary	2.05	2.05	2.05	1.95
Cold-rolled sheets, No. 20, Pittsburgh	3.05	3.05	3.05	2.95
Cold-rolled sheets, No. 20, Gary	3.15	3.15	3.15	3.05
Wire nails, Pittsburgh	2.05	2.05	2.05	2.40
Wire nails, Chicago dist. mill	2.10	2.10	2.10	2.45
Plain wire, Pittsburgh	2.50	2.50	2.50	2.30
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.35
Barbed wire, galv., Pittsburgh	2.55	2.55	2.55	2.80
Barbed wire, galv., Chicago dist. mill	2.60	2.60	2.60	2.85
Tin plate, 100-lb. box, P'gh	$5.25	$5.25	$5.25	$5.25

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Pig Iron

Per Gross Ton:	Nov. 2, 1936	Oct. 27, 1936	Oct. 6, 1936	Nov. 5, 1935
No. 2 fdy., Philadelphia	$21.3132	$21.3132	$21.3132	$21.3132
No. 2 Valley furnace	19.50	19.50	19.50	19.50
No. 2, Southern Cin'ti	20.2007	20.2007	20.2007	20.2007
No. 2, Birmingham†	15.88	15.88	15.88	14.50
No. 2, foundry, Chicago*	19.50	19.50	19.50	19.50
Basic, del'd eastern Pa.	20.8132	20.8132	20.8132	20.8132
Basic, Valley furnace	19.00	19.00	19.00	19.00
Malleable, Chicago*	19.50	19.50	19.50	19.50
Malleable, Valley	19.50	19.50	19.50	19.50
L. S. charcoal, Chicago	25.7528	25.7528	25.7528	25.2528
Ferromanganese, seab'd carlots	75.00	75.00	75.00	85.00

†This quotation is subject to a deduction of 38c. a ton for phosphorus content of 0.70 per cent or higher.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$17.50	$17.50	$18.25	$13.25
Heavy melting steel, Phila.	15.75	15.75	15.75	12.00
Heavy melting steel, Ch'go	16.50	16.25	16.25	12.50
Carwheels, Chicago	16.50	16.50	16.50	12.75
Carwheels, Philadelphia	16.75	16.75	16.75	12.75
No. 1 cast, Pittsburgh	16.25	16.25	16.25	14.25
No. 1 cast, Philadelphia	16.75	16.75	16.75	12.75
No. 1 cast, Ch'go (net ton)	14.00	14.00	14.00	11.25
No. 1 RR. wrot., Phila.	15.75	15.75	15.75	12.25
No. 1 RR. wrot., Ch'go (net)	14.25	14.25	14.25	9.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.75	$3.75	$3.75	$3.60
Foundry coke, prompt	4.25	4.25	4.25	4.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn.	10.00	9.75	9.75	9.00
Lake copper, New York	10.12½	9.87½	9.87½	9.37½
Tin (Straits), New York	45.87½	44.60	45.40	50.75
Zinc, East St. Louis	4.85	4.85	4.85	4.85
Zinc, New York	5.22½	5.22½	5.22½	5.22½
Lead, St. Louis	4.65	4.45	4.45	4.35
Lead, New York	4.80	4.60	4.60	4.50
Antimony (Asiatic), N. Y.	12.50	12.50	12.50	16.37½

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
Nov. 2, 1936	2.197c. a Lb.	$18.73 a Gross Ton	$16.58 a Gross Ton
One week ago	2.197c.	18.73	16.50
One month ago	2.197c.	18.73	16.75
One year ago	2.130c.	18.84	12.58

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output.

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1936	2.197c., Sept. 29	2.084c., Mar 10	$18.84, Jan. 7	$18.73, Aug. 11	$16.75, Sept. 22	$12.67, June 9
1935	2.130c., Oct. 1	2.124c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, April 23
1934	2.199c., April 24	2.008c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

tion in backlogs over the past week, however, has slowed up to some extent, since new bookings have shown a tendency to increase. The improvement in demand emanates mostly from miscellaneous sources. There has been no let-up on the part of many consumers to exert pressure on the mills for better deliveries. While there is not an actual shortage of cars, some producers are having difficulty in getting the proper type railroad cars for certain steel products.

Cold-Finished Bars

Bookings at fourth quarter prices so far this month have been beyond the expectations of producers, and during the past week further improvement has been noted. Practically all of this gain has come from miscellaneous sources, and in many cases the customers are the same ones who ordered heavily last month. Considerable tonnage is moving to machinery and electrical appliance manufacturers. Some customers, such as washing machine manufacturers, are actively engaged on their 1937 production programs. Opinion is very definite that steel going to the consumers is finding its way into consumption rather than being stocked. Proof of this contention is the daily occurrence of requests for better delivery service. Some automotive interests have been taking large tonnages of steel, but other companies have yet to come in the market for larger purchases.

Reinforcing Steel

New projects were rather scarce in the past week. It appears that no large number of jobs will be forthcoming until next spring. Mills are busily engaged cleaning up orders now on the books before cold weather sets in. Current orders consist, for the most part, of last-minute requests from jobbers attempting to finish up on projects now in construction.

Strip

Total bookings over the past week have shown some improvement. The lull in the ordering of wide strip, noticeable a few weeks ago, has vanished with specifications now showing better volume. This is attributable to larger tonnages being taken by automotive interests. Miscellaneous sources continue to be one of the main supports in this market. Makers of cash registers have been ordering freely within the past few days and fair tonnages have been going to manufacturers of washing machines who are rushing through plans for early 1937 production. There has been no change with respect to good movement of material to automobile parts makers and an improvement has been noted in shipments to radio manufacturers.

Tin Plate

Operations remain around 93 per cent of capacity. Mills have received additional orders representing 1937 packers' requirements. Specifications from general line can manufacturers have been in better volume over the past several days. In the aggregate, producers have enough tonnage on the books to maintain present rate of operations for at least the next few weeks, and there is no evidence of any drastic falling off in operations.

Steel Sheet Piling

Jones & Laughlin Steel Corp. has received the award for 1875 tons of steel sheet piling to be used in construction a bulkhead at Marine Park, Great Kills, Staten Island. Approximately 221 tons of accessories will be used on this job. F. M. Gaddis, Boston, is low bidder for the general contract for the construction of a seawall at Roughan's Point, Revere, Mass., involving 966 tons of piling. A few projects involving considerable tonnages are now pending, and awards are expected shortly.

Tubular Products

Bookings for oil-country goods in the past week have shown no deviation from the steady flow prevalent a few weeks ago. Aggregate demand for standard pipe is mounting and represents a substantial portion of pipe tonnages on producers' books. Expanded repair programs at railroad shops have precluded any dropping off in demand for locomotive boiler tubes, specifications being received in good volume. There is also brisk activity in the movement of merchant boiler tubes.

Wire Products

Within the past few days a decided improvement has occurred in bookings of manufacturers' wire. Orders during the first three weeks of October were extremely light and it is encouraging to note that the present improvement in volume is attributable in many cases to customers who had previously placed larger orders. For the first time in several years the price situation is a minor issue, delivery being the most important question. Recently announced prices have been holding firmly. There has also been a better volume of merchant wire buying at fourth quarter prices. In all cases new bookings call for shipment as soon as possible. Meanwhile, producers are actively engaged in their attempt to clean up large tonnages of manufacturers' wire placed last month. Considerable pressure is being exerted in some quarters for better delivery since consumption of wire products remains at a high level. Automobile manufacturers are taking a large percentage of wire, but miscellaneous sources such as bolt and nut, and wood screw manufacturers are well represented in the total production.

Sheets

Bookings in the past week show further improvement over a week ago. No change has occurred in the widely diversified sources ordering at the present time. Not only have the number and variation of customers increased, but actual tonnages ordered have shown improvement. Electrical appliance manufacturers are specifying freely, while automobile tonnages are being received in good volume. Deliveries are no better and backlogs, depending on the size and grade, still average around six to eight weeks.

Coal and Coke

Inquiries for domestic size beehive coke from the Western and Buffalo districts have eased off slightly within the past week. This has been more or less expected by producers, since shipments from this district to those points have been extremely heavy. Total tonnages shipped so far this season have been far above the amount moved last year. This condition is due to the fact that by-product coke producers serving those areas needed their production for themselves or for their old customers, leaving all new customers' inquiries to find their way to beehive coke producers. By-product plants have made every effort to satisfy the demands of their regular customers and quite a few of them which operate merchant stacks have gone so far as to purchase beehive furnace coke for their own blast furnaces so as to continue shipments of by-product coke to regular customers. A flood of new inquiries from distant points for domestic coke is expected as soon as colder weather sets in, and the ultimate picture for this type of fuel has not changed materially. One operator has leased rectangular by-product coke ovens at Alicia, Pa., from a local independent steel interest. Total ovens in this area amount to 400, although it is expected that only a small part of these will be put in use shortly, pending the coke market situation later on in the year. Within the next month or so producers having beehive furnace contracts will of necessity have to concentrate their attention on the production of these tonnages, since winter weather normally affects the operation of beehive ovens.

. . . . CHICAGO . . . .

. . . Ingot output higher, though sales have dropped slightly.

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. . . Railroad equipment buying looks promising for early action.

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. . . Heavy melting scrap moves up 25c. a ton.

CHICAGO, Nov. 2.—Ingot output is again swinging upward, having gone above 76 per cent, which is a gain of over one point from the average of a week ago.

Whether or not one attributes the condition to the election, it is a fact that both sales and shipments of finished steel have slackened during the past week or so. There is no direct indication that consumption is actually falling back, though the outlook for use of structural materials is unfavorable. However, backlogs at structural shops are of fair size and fabricators can feed a considerable tonnage to mills.

The heavy tonnage products will undoubtedly come in for a wide swing as the result of a railroad equipment program which promises to reach large proportions. Several Western lines are not only studying this problem from the viewpoint of immediate and nearby needs, but they are taking the long-range sight, which looks two, three and even four years ahead. When this is done the talk is not of 2000 to 3000 cars, but the figure grows upward to totals like 10,000 units.

Purchases of rails are coming to the fore and mills expectantly await developments during the next three weeks.

Heavy melting steel is up 25c. and moves by brokers show that they believe the top is still to come.

Pig Iron

The mark-up of foundry iron of $1 a ton at Boston has brought local users to their feet with a jerk. Some of them are already rushing in to acquire additional tonnages, the realization having dawned upon them that prices in Chicago are strong and that nothing can be lost by taking additional tonnages. October shipments established a peak for the year to date and November promises to be a good month.

Coke

Prices which prevailed in October are being extended for November deliveries. October shipments climbed above the September total, and the fear of foundry coke shortages, which appeared last month, no longer plagues consumers.

Sheets

Order books are heavy and most units will operate full to the end of the year. Miscellaneous use is beginning to show some signs of spottiness, but automobile demand is growing and is probably three weeks away from the fall peak.

Warehouse Business

October, as gaged by number of orders, is taking the peak position of the year and it may take like place in dollar sales. This is interesting for the reason that price changes caused the last week in September to be the top seven-day period of the year. After a slow start in October sales started to climb and their march has been steadily upward. This October showing, according to a 20-year record, indicates to warehousemen that a good year lies ahead. Country sales, contrary to position in past years, are nip and tuck with the movement in urban areas.

Reinforcing Bars

The drift downward in both awards and fresh inquiries continues, though the change is less noticeable now than it was several weeks ago. The largest current award is 400 tons by the Sanitary District, which has also placed several carlot orders. The 500 tons needed for the North section of the Outer Drive, Chicago, has been rejected and will be readvertised. Chicago is about to launch a school building program which may call for as many as 20 structures.

Plates

It is now announced that the Burlington will add 3000 new freight cars, and, because of past performance, the trade believes these cars will be constructed in that railroad's shops. This announcement may prove to be the opening gun of an exceptionally large equipment building program. One railroad estimates that its long range car buying program will ultimately reach 10,000 units. It is this phase of the steel market which may return plate mills to a position somewhere near their former glory. Materials for old car orders are still reaching mills but specifications are growing lighter. Tank shops are fighting their way through a lean market in which backlogs of old miscellaneous orders are their main support.

Rails

The outlook for new purchases is exceptionally good and the next two to three weeks promise to be unusually active. Formal orders are expected to be issued by the Chicago and North Western any day and another western railroad has allocated 8000 tons. Purchases in 1936 are running 35 per cent ahead of last year and mills, as they look ahead, view the coming year as one which will exceed 1936 by at least 25 per cent. Railroads are planning fall accessory orders in close conformity with rail business, which shows that purchases at the time of the early fall price change did not look as far to the future as was generally supposed at that time. Rolling schedules are light and new tonnages are extremely welcome.

Structural Material

Old orders are still pushing a flow of specifications to mills but shops find a scant tonnage of new work to divide among themselves. Total awards stand above the 7000-ton mark but these are widely scattered over a vast territory. The same story holds true of the 10,000 tons of fresh inquiries, with the net result that fabricators in no one area are satisfied with the outlook. Typical of what is taking place are the orders received

recently by one of the large shops where the half dozen awards were all under the 50-ton mark.

Wire Products

Both specifications and sales of wire mill products during the month of October reached a new high, which makes last month the best since 1929. The manufacturing trade is excellent and will climb higher as automobile manufacturers work upward to the fall peak. Utilities demand for electrical cables is mounting and the coming year is expected to mark a real revival in this commodity. Wire rope is also returning to favor and shipments are not far from normal for this time of year. Use of nails is steady but low, a condition not unexpected in a market which is undergoing a natural shrinkage.

. . . Mystic furnace advances pig iron $1 a ton.

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. . . Small award of building steel more plentiful.

BOSTON, Nov. 2.—The Mystic Iron Works, effective Nov. 4, will advance its price of pig iron $1 a ton, bringing No. 2 foundry iron up to $21.50 a ton on cars at Everett. Furnace representatives are currently booking pig iron orders every day, generally for small lots. However, there is no snap to buying. Nonetheless aggregate weekly sales of about 3000 tons is generally considered satisfactory. Pending the election, foundries have been inclined toward conservatism, despite the fact that most of them have more business on their books than they had a month or two ago. Connecticut melters are especially well off as to orders.

No noticeable increase was made the past week in New England manufacturing operating schedules, but there was a definite pick-up in textile buying, both retail and wholesale. Footwear makers have about cleaned up on orders and are making spring line samples. Industry, generally, is little more than holding its own in this area.

Large fabricated steel, reinforcing steel bar and cast iron pipe tonnages have become scarce, although some sizable tonnages of reinforcing bars for New Hampshire projects should shortly be announced. On the other hand, small business is very good, and takers are said to be making satisfactory profits on these less impressive but more abundant orders.

. . . Pig iron output highest since 1931.

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. . . Steel production also increased again.

BIRMINGHAM, Nov. 2. — Pig iron production was increased last Wednesday when the Woodward Iron Co. blew in its third furnace, raising the district's total to 13, the largest number since June, 1931. During October there was a gain of three furnace, the Tennessee Coal, Iron & Railroad Co. having blown in two on Oct. 15.

Steel production was also increased last week over the two preceding weeks, and will be further increased again this week. Last week there was an increase in open hearths from 13 to 14 and this week 15 are scheduled. The Tennessee company will operate four at Ensley, seven at Fairfield; Gulf States Steel Co. four at Gadsden. This equals the high point of the year.

The Ensley rail mill began production on Monday and will probably continue in steady operation for at least five months, according to present expectations.

The Tennessee company announced last week that additional facilities are to be installed in its Fairfield sheet mill, which will provide an increase of 40,000 tons annually. This new project is in addition to the program announced Oct. 15.

The prospectus of the Gulf States Steel Co., covering its new financing plans, will be mailed out this week to stockholders. This shows that $2,653,614.72 will be reserved for improvements and other purposes.

Warrior River Terminal Co. asked bids last week on 20 40-ton steel box cars. The railroad, running from Ensley to Port Birmingham, on the Warrior River, is owned by the Inland Waterways Corp.

The U. S. Engineer Office, Mobile, postponed the date for opening bids on the construction of a new lock and dam on the Warrior River at Tuscaloosa, Ala., from Oct. 28 to Nov. 10, to permit revision in some of the specifications.

Employees of the Tennessee Coal, Iron & Railroad Co. have requested wage increases ranging from 5 to 15 per cent.

Demand for iron and steel continues good. October shipments were higher than those of September.

. . . Demand expanding; plant additions announced.

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. . . Pig iron deliveries highest for the year.

TORONTO, ONT., Nov. 2.—Demand for iron and steel in the Canadian markets is expanding steadily and in addition to orders from domestic consumers sales on export account are increasing. The Dominion Steel & Coal Corp., Sydney, N. S., is said to have closed on several sizable contracts from British sources, and, as a result, is preparing to spend some $300,000 on plant improvements and additions. Canadian Car & Foundry Co., Montreal, will go in for the production of airplanes and intends to add to its general plant equipment. Several other companies, including Steel Co. of Canada, Hamilton, and Algoma Steel Corp. also are spending several hundreds of dollars on plant replacements as a result of new business. Warehouse operators report a better demand for various lines of iron and steel as well as other general commodities.

In the pig iron markets, sales are steadily increasing with present deliveries at the highest level for the year. Inquiries are again appearing in the markets and several have been reported recently calling for lots up to 300 and 400 tons. Most orders, however, are for spot delivery and average sales are between 100 and 200 tons. A few melters are stocking iron for several months ahead. Sales are running at about 1200 tons weekly. Pig iron production also is climbing steadily with five furnaces blowing and production at approximately 50 per cent of all blast furnace capacity in Canada. Prices are firm and unchanged.

. . . CLEVELAND . . .

. . . Stepping up of automobile production aids steel business.

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. . . Central district furnaces expected to advance pig iron prices.

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. . . Lake ore movement to Nov. 1 is 41,063,872 tons.

CLEVELAND, Nov. 2.—Ingot output in the Cleveland-Lorain district is unchanged this week at 84 per cent of capacity. One open hearth furnace in Lorain has been taken off but another was put on in Cleveland today. Several changes in operating rates were made in the Youngstown district, where the steel plants are on a 75 per cent schedule this week for a loss of one point.

With the stepping up of automobile production, new demand for finished steel from that source has expanded and is expected to help maintain steel business at is recent volume, although there has been some tapering off in the demand from other buyers. Structural activity is light and little business is coming from railroads centered here.

Sheet mills are adopting the change in quantity extras announced by a leading maker last week.

The announcement of $1 a ton price advance on pig iron by a New England maker is construed to indicate that Central district furnaces will make a similar advance without much delay. The price is likely to be marked up over night without giving consumers an opportunity to buy additional iron at present prices. Buyers, it is pointed out, have been given sufficient notice that a price advance is imminent. Considerable new inquiry for pig iron came out immediately after the Eastern advance was made known.

With iron ore shipments over 41,000,000 tons up to Nov. 1 shippers now expect that the season's movement will exceed 46,000,000 tons.

Pig Iron

New releases in sizable lots for both foundry and malleable iron came from some of the automobile parts manufacturers the past week. The increase in the demand due to the speeding up of motor car production is expected to result in considerably heavier shipments in November than in October. Shipments last month showed some increase over September. Sales are light and confined to small lots. As most consumers are under contract, not much activity is expected until Dec. 1, when books will be opened for the first quarter.

Iron Ore

Water shipments of Lake Superior ore during October amounted to 7,301,284 tons, a gain of 2,700,623 tons over the same month last year. Shipments to Nov. 1 were 41,063,872 tons, a gain of 14,258,998 tons, or 53.2 per cent, over the same period last year. The movement in October fell off 179,787 tons as compared with September. The decrease was due to unprecedented cold weather with near zero temperature at upper Lake ports late in the month which delayed loading of boats 60 hr. Shipments of at least 5,000,000 tons are expected this month which will bring the season's movement up to 46,000,000 tons.

Bars, Plates and Shapes

With increased demand from forge shops and other makers of automobile parts, orders for steel bars have improved. Structural shapes and plates are rather quiet. Activity in the construction field is limited mostly to small lots and not much new work is in prospect. A grade crossing elimination job taking 220 tons has been placed and the State Highway Department is expected to have plans out shortly for a similar project requiring 600 tons.

Strip Steel

Demand for both hot and cold-rolled strip from the motor car industry shows a moderate gain. Non-integrated cold rolling plants are ordering hot-rolled material freely. Deliveries are fair on hot strip but still far extended on cold strip.

Sheets

New demand from the automotive industry took a spurt the past week when orders for several sizable lots were placed for delivery as soon as mills can roll the steel. Stamping plants making automobile parts are specifying freely, and good specifications continue to come from manufacturers of refrigerators and other household equipment. Some of the mills entered almost as much tonnage in October as during September and several are about filled up for the remainder of the year.

. . . CINCINNATI . . .

. . . Sheet mill backlogs continue to increase.

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. . . Possibility of a car shortage looms.

CINCINNATI, Nov. 3.—A constant heavy demand for finished sheets sustains mill operations in this area at full capacity and backlogs are mounting weekly. With mill inventories almost exhausted, further extension of deliveries is anticipated. Most units now are under full programs through November with some contracted into December. Spectacular ordering is absent, although sheet users are anticipating needs to insure good positions on rolling schedules. Shipments are going forward at a good rate, although railroad cars are getting scarcer and the possibility of a shortage looms. Prices are regularly firm, but talk of an increase for the first quarter is heard.

Pig iron sales in small quantities adhere to average levels, but substantial ordering has subsided at least for the past week. The trade indicates this recession from

heavy anticipatory ordering was largely due to the influence of election week, and it is expected that melters will return to the market this week. This is substantiated by the fact that the melt is steadily improving and melters are in need of material regularly. Improvement in the machine tool melt has boosted foundry operations to above 70 per cent during the past week. Other casting makers report good business and prospects. The settlement of foundry labor difficulties for the time being has added to market optimism, although further wage and hour conversations are expected in the new year.

Foundry coke is moving steadily on contract, but new business is limited to fill-in orders. Domestic grades have reacted to the stimulus of cooler weather.

. . . *Pig iron shipments heavy in October.*

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. . . *Finished steel demand is somewhat quieter*

ST. LOUIS, Nov. 2.—October shipments of pig iron were reported to be the largest for any month this year, March having previously held this record, and were about 12 to 15 per cent larger than those of September. There is still some buying, principally by melters who believe that prices will advance. The melt in the district continues at a heavy rate. The stove industry is especially busy, and it is reported that one foundry in Iowa is working seven days a week. In the Belleville district the full six-day week is being observed. Orders continue to come in, and in some quarters it is being predicted this early that the plants will continue at this high rate through 1936, instead of curtailing operations on Dec. 1, as they usually do. Jobbing foundries continue to be very busy.

Demand in most lines of finished iron and steel has quieted down some, with the exception of the oil fields, which are buying pipe and other needed supplies. Bids are due Nov. 10 for a highway bridge across the Red River in Oklahoma requiring 1650 tons of structural shapes. Winn Construction Co. has been awarded the general contract for a clinic at the State hospital at Nevada, Mo., involving 130 tons of reinforcing bars. Bids will be opened here Nov. 4 for a public school building, which will utilize 110 tons of reinforcing bars.

Auburn, Mass., has preliminary plans for a water system to cost about $50,000 and has applied for a WPA grant.

Boonville, Mo., will take bids about Nov. 15 for pipe for water system, and other waterworks installation, including filtration equipment, motor-driven pumping machinery and auxiliary equipment. Cost about $75,000. Burns & McDonnell Engineering Company, 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Long Beach, Cal., plans 6, 8 and 10-in., for water system in Rogers and Eleanor Streets, Gaviota Avenue and other thoroughfares. J. W. B. Blackman is city engineer and director of public service.

Port St. Joe, Fla., plans pipe lines for water system and other waterworks installation. Fund of $130,000 has been secured through Federal aid for this and sewerage system. William Galt is city manager.

Dresser Junction, Wis., plans pipe lines for water system and other waterworks installation. Fund of $25,455 has been secured through Federal grant and loan. P. R. Banister, Hudson, Wis., is consulting engineer.

Fillmore, Utah, plans about 14,000 ft. of 6 and 8-in. for water system, replacing present concrete pipe for main supply line. Financing has been arranged through Federal aid. C. J. Ullrich, Ness Building, Salt Lake City, Utah, is consulting engineer.

Bucklin, Mo., plans pipe lines for water system and other waterworks installation, including elevated steel tank and tower. Cost about $40,000. Financing is being arranged through Federal aid. W. B. Rollins & Co., Railway Exchange Building, Kansas City, Mo., are consulting engineers.

Sewerage and Water Board, New Orleans, has applied for Federal financing for new lines for trunk water supply, recently referred to in these columns, to cost about $446,000, comprising 10,000 ft. of 48-in., and 6000 ft. of 30-in., with fittings, valves, etc. A. F. Thread is general superintendent.

Sullivan's Island (P. O. Moultrieville), S. C., plans 28,805 ft. of 2 to 10-in. for water system; also 100,000-gal. elevated tank and tower, 300,000-gal. ground storage tank, pumping machinery and auxiliary waterworks equipment. Fund of $132,727 has been secured through Federal aid.

Oshkosh, Wis., will ask bids in about 60 days for pipe for extensions in main water and distributing lines. Cost about $71,800, of which $32,343 has been secured through Federal grant. A. E. Hintz is manager of water department.

Los Angeles Department of Water and Power will open bids Nov. 10 on 1949 tons of 6, 8, and 12-in. pipe, and Nov. 12 on 2888 tons of 8 and 12-in.

Southern Pacific has applied to Interstate Commerce Commission for authority to issue $9,150,000 in equipment trust certificates under the so-called Philadelphia plan to aid in purchase of approximately $12,446,654 worth of equipment. The equipment, which was distributed to builders in June, consists of 18 locomotives, and 2746 cars. Cars include 1750 box, 750 automobile, 100 gondola, 102 flat, 20 baggage-horse and 24 streamlined passenger cars. Distribution of the equipment was as follows: 12 locomotives with tenders to Baldwin Lomomotive Works, six semi-streamlined locomotives with tenders to Lima Locomotive Works, Inc., 500 steel-sheathed wood-lined box cars each to Pullman-Standard Car Mfg. Co., Pressed Steel Car Co., Bethlehem Steel Co., 250 steel-sheathed wood-lined box cars to American Car & Foundry Co., 500 steel-sheathed wood-lined automotive cars with Evans auto loaders to General American Car Co., 250 steel-sheathed wood-lined automobile cars with Evans auto loaders to Mount Vernon Mfg. Co., 100 steel drop-end gondola cars and 102 steel flat cars to Southern Pacific Equipment Co., 20 80-ft. steel baggage-horse cars to St. Louis Car Co., 24 steel streamlined passenger train cars to Pullman-Standard Car Mfg. Co.

St. Louis-Southwestern has applied for authority to purchase boilers, frames and other locomotive parts with which to assemble five locomotives of 4-8-4 type in its shops at Pine Bluff, Ark., at an estimated cost of $550,000; also to purchase heavy-duty machinery to cost $128,500, and 10 air-conditioned passenger coaches to cost $500,000, all to be paid in cash.

Warrior River Terminal Co., Birmingham, is in the market for 20 40-ton box cars.

Union Pacific plans to purchase about 20 large passenger locomotives, according to an announcement by Carl Gray, president.

New York Central may buy 60 locomotives instead of the 50 originally inquired for. The additional 10 will be switching engines.

Western Pacific is expected to enter the market soon for 10 locomotives.

Chicago, Burlington & Quincy directors have approved expenditures of $8,000,000 for five 4-8-4 type locomotives and 3250 freight cars. Of the total, 1750 will be either hopper or composite coal cars, 1000 box cars, 250 automobile cars, 100 flat cars and 150 stock cars.

Louisiana & Arkansas is considering purchase of 80 hopper cars.

Louisville & Nashville is considering repair of 300 to 400 freight cars. An inquiry has been issued for 2000 tons of car material.

Kansas City Southern has awarded a total of 900 freight cars, an addition of 100 to the 800 mentioned in these columns last week. The Mount Vernon Car Co. was awarded 100 gondola cars. Four air conditioned coaches and a combination dining and chair car was also ordered from Pullman-Standard Car Mfg. Co.

St. Louis-Southwestern is inquiring for five 4-8-4 type locomotives.

Mexican Petroleum Co. is inquiring for one locomotive.

Ferrocarrill de Ambelema, Ibague, Colombia, is inquiring for one 4-8-0 locomotive.

RAILS AND TRACK SUPPLIES

Kansas City Southern is asking for bids on 8000 tons of 127-lb. rails for 1937 delivery.

Western Maryland has placed orders for 3500 tons of rails.

Richmond, Fredericksburg & Potomac has ordered 1575 tons of 131-lb. rails from Bethlehem Steel Co.

... Steel mill operations unchanged.

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... Shape and bar markets are quiet.

BUFFALO, Nov. 3.—Steady operation is being maintained by Buffalo steel mills with Bethlehem's Lackawanna plant operating 22 open hearths, Republic, 7 and Wickwire-Spencer Steel Co., 2.

Pig iron demand is constant with regular specifying against earlier orders. Few new lots are being sold. Foundry operation is steady.

Quietness reigns in the fabricated structural and reinforcing bar fields, with not a single sizable contract let during the past week.

... Pig iron shortage causes virtual suspension of trading.

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... Heavy steel orders increase; shipbuilders large buyers.

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... Tin plate makers reluctant to take export orders.

LONDON, Nov. 2 (*By Cable*).—Trading in Cleveland pig iron has been practically suspended owing to lack of supplies. Serious inconvenience to consumers has been avoided by careful supervision of distribution of available supplies. Contracts already booked will absorb nearly whole of hematite output up to the end of February and foundry iron to the end of March. Ore and coke shortages are preventing the lighting of additional furnaces.

Steel is comparatively quiet as makers can accept orders only for far forward delivery. Substantial imports of Continental semi-finished steel will follow the introduction of a new license system this week, but demand for British bars and billets is unrelaxed. Heavy steel makers are working at full capacity and are booked well forward. Numerous orders for new ships which have been placed recently assure continuation of the present large demand for shipbuilding steel. Danish shipbuilders have ordered British steel to the value of almost £500,000.

There is fair home and export business in tinplate. Some makers are reluctant to accept forward business owing to the rising tendency of steel prices. Continental iron and steel is fairly active, especially bars and semi-finished. Thin sheet sales are brisker and Russia is inquiring for 8000 tons.

British prices unchanged. Continental gold prices unchanged.

... Maritime strike throttles steel industry.

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... New pipe projects total 4840 tons.

SAN FRANCISCO, Oct. 30.—Pacific Coast shipping was brought to a standstill today as 37,000 maritime workers staged a long-threatened walk-out after a third 24-hour extension of the 1934 agreement between ship-owners and longshoremen. The strike threatened to become nation-wide in its effects as ship unions at New York staged a sympathetic sit-down strike. San Francisco warehouse unions were also preparing to walk out today, leaving the steel industry and all other industries in a state of inactivity. Officials predicted that unless a new agreement is drawn up within the next few days, the present strike will reach greater proportions than the general walk-out of 1934.

The labor situation, coupled with indecision over the outcome of the election next week, led to an unusually quiet week in the Pacific Coast steel markets. No outstanding awards were made and only two sizable new projects are pending. The Los Angeles Department of Water and Power will open bids on 1950 tons of 6-, 8-, and 12-in. cast iron pipe Nov. 10 and on 2890 tons of 8- and 12-in. cast iron pipe Nov. 12. These two tonnages will be put to use in the construction of water supply lines in Southern California.

Bids have been opened on 906 tons of reinforcing steel for use in the All-American Canal project. No award has yet been made for the $6,350,000 Federal post office and jail in Los Angeles.

Nebraska Gas Fuel Co., Lexington, Neb., plans welded steel pipe line from connection with main trunk line to Alma, Neb., for natural gas transmission, with steel pipe line distributing system at last noted place, where franchise is being secured. A gas distributing station will be built at town limits. Entire project will cost close to $85,000.

Bureau of Reclamation, Denver, asks bids until Nov. 12 for welded plate steel discharge pipe and appurtenances for installation at Dead Ox pumping station district, Owyhee Project, Oregon-Idaho (Specification 850-D); until Nov. 16, two 66-in. diameter, welded steel outlet pipe for installation in works at Alamogordo Dam, Carlsbad Project, N. M. (Specifications 849-D).

White Salmon, Wash., plans 10 and 12-in steel pipe lines for main water system. Installation will total about 37,000 ft., part to be creosoted wood stave pipe. Entire project will cost about $89,000, of which $40,000 has been secured through Federal grant. A. C. Hanson, Goldendale, Wash., is consulting engineer.

J. H. Gates, Denver, has been awarded contract for 15½ miles of 4½-in. Lindewelded pipe line for oil transmission from Abandoned Peak, Colo., to Chama, N. M.

Crosby & Moran, Inc., Tulsa, Okla., has awarded contract to J. R. Stewart Construction Co., Tulsa, for four-mile 6 and 8-in. gathering pipe line and four and one-half miles of 16-in. pipe, all Lindewelded, for natural gas transmission to Fittstown gasoline plant of first noted company.

Ministry of Industry, State Oilfield Directorate, Government of Argentina, Buenos Aires, plans early purchase of about 52,500 ft. of 6-in. steel pipe for oil transmission from Argentina oil field districts; also will take bids for installation, including fusion welding in field.

Cities Service Gas Co. will build seven and one-half miles of 6⅛-in. Lindewelded pipe line near Mattfield Green, Kan.

West Michigan Consumers Co. has started construction on 6-in., 12-mile Lindewelded pipe line from point near Ravenna, Mich., to Muskegon.

Board of Water Commissioners, Denver, asks bids until Nov. 10 for 17,570 ft. of 63-in., 12,850 ft. of 57-in., 6550 ft. of 51-in., 40 ft. of 36-in., and 650 ft. of 30-in. steel pipe for water trunk mains, with alternate bids for concrete pipe. H. S. Crocker, First National Bank Building, is consulting engineer.

J. N. Huber Co., Lance Creek, Wyo., will build a two-mile, 10-in. Lindewelded pipe line, to replace an 8-in. natural gas line to carbon black plant.

. . . . NEW YORK. . . .

. . . October steel business in good volume though below shipments.

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. . . Structural steel only product in which dullness is apparent.

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. . . Reclassification of tin mill black plate being considered.

NEW YORK, Nov. 2.—October steel business, while below that of September in volume with most sellers, was quite satisfactory. Some of the speed and pressure that characterized the early part of October has disappeared, there being less urgency about deliveries owing to the heavy shipments last month, which have placed most consumers and jobbers in a more comfortable position as to stocks.

Production and shipments this month probably will not be quite so heavy as in October, but the trade agrees with the views stated last week by President E. G. Grace of Bethlehem Steel that the fourth quarter as a whole will compare favorably with the third quarter.

Structural steel is the only important steel item that has been showing any marked letdown in demand, as no large volume of work has come up for bids within the past several weeks. It is known, however, that a good deal of work is pending and some of this may come into the market after the election excitement has died down.

Some mills are considering a reclassification of tin mill black plate whereby No. 29 gage and lighter will be sold on a black plate base and No. 28 gage and heavier on a sheet base.

Pig Iron

Mystic furnace at Everett, Mass., advanced the price on all grades $1 a ton, effective Nov. 4. This is the first increase in domestic pig iron quotations since November a year ago. Other producers are believed to be ready to announce similar increases. The local market is strong, with consumption 10 to 20 per cent heavier than it was a month or so ago. Small-lot orders are more numerous, though in general sales do not reflect the situation's innate strength due to previous opportunity to buy for the quarter.

Reinforcing Steel

Awards are light this week, and new business over the next few weeks does not seem impressive at the moment. George H. Flinn, New York, was low bidder on 250 tons of bars for a section of the Sixth Avenue subway which was up for bids Friday, while W. Ames & Co. were low on 211 tons of bars for a New York Treasury Department letting. Price cutting is still prevalent throughout the district, especially in New Jersey.

REINFORCING STEEL

. . . Awards of 2625 tons —1765 tons in new projects.

AWARDS

Deerfield-Sunderland, Mass., 300 tons, bridge and approaches, to Bethlehem Steel Co.

Malden, Mass., 100 tons, Continental Can Co. plant, to Joseph T. Ryerson & Son, Inc.

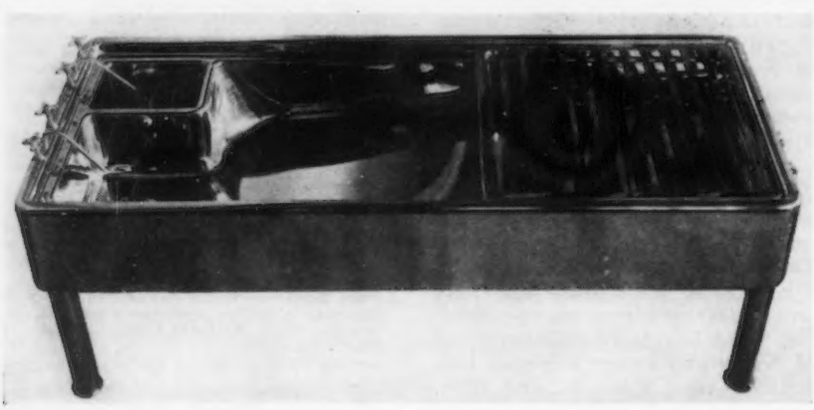
Malden-Saugus, Mass., 240 tons, State bridge, to Bethlehem Steel Co.

Saugus, Mass., 183 tons, State bridge, to Bethlehem Steel Co.

Ashburnham, Mass., 190 tons, State bridge, to Bethlehem Steel Co.

Millbury-Sutton, Mass., 120 tons, State bridge, to Truscon Steel Co.

Grafton-Shrewsbury, Mass., 105 tons, State bridge, to an unnamed bidder.



18 and 8 stainless has found a relatively new application in the form of an autopsy table. The table illustrated was fabricated of Allegheny metal by the Gloekler Mfg. Co., Erie, Pa.

Westerly, R. I., 100 tons, State bridge, to Truscon Steel Co.

Chicago, 400 tons, Sanitary District, to Concrete Engineering Co.

Los Angeles, 365 tons, buildings for Western District high school, to Concrete Engineering Co.

Los Angeles, 400 tons, buildings for Verdugo Road District high school, to Blue Diamond Steel Corp.

San Francisco, 117 tons, Echlin building, to Hauck & Co.

NEW REINFORCING BAR PROJECTS

Somerville, Mass., 282 tons, Ford Co. plant addition.

Chicago, tonnage being estimated, Wendell Phillips public school.

Oshkosh, Wis., 500 tons, Winnebago County courthouse and jail; bids Nov. 30.

Nevada, Mo., 130 tons, State hospital; Winn Construction Co., Kansas City, general contractor.

Gulfport, Miss., 150 tons, Veterans' hospital; Algernon Blair, Montgomery, Ala., low bidder on general contract.

St. Louis, 110 tons, school for colored children; bids Nov. 4.

Denver, 252 tons, material for Salt River project; bids opened.

Sacramento, Cal., 100 tons, State highway construction; bids Nov. 18.

San Francisco, 119 tons, sheds for Piers 9 and 19; bids opened.

Alameda, Cal., 119 tons, section E, sewer construction; bids opened.

Pipe Die Heads in New Stationary-Work Sizes

THE Landis Machine Co., Inc., Waynesboro, Pa., has added a 10-in. size head to its line of stationary pipe die heads.

Two models include a head for standard pipe threads and a heavier model for oil country tubular goods. The capacity of the standard head is 4 in. to 10-in. pipe threads and that of the heavier model from 4½-in. to 10¾-in. o.d. thread.

The standard die head is fitted with 2¾-in. wide chasers and will cut all standard lengths within its range. The heavier model can be fitted with 3 11/16-in. wide chasers for a maximum thread length of 3 5/16 in., or with chasers 4⅜ in. wide for all thread lengths up to and including 4 3/16 in.

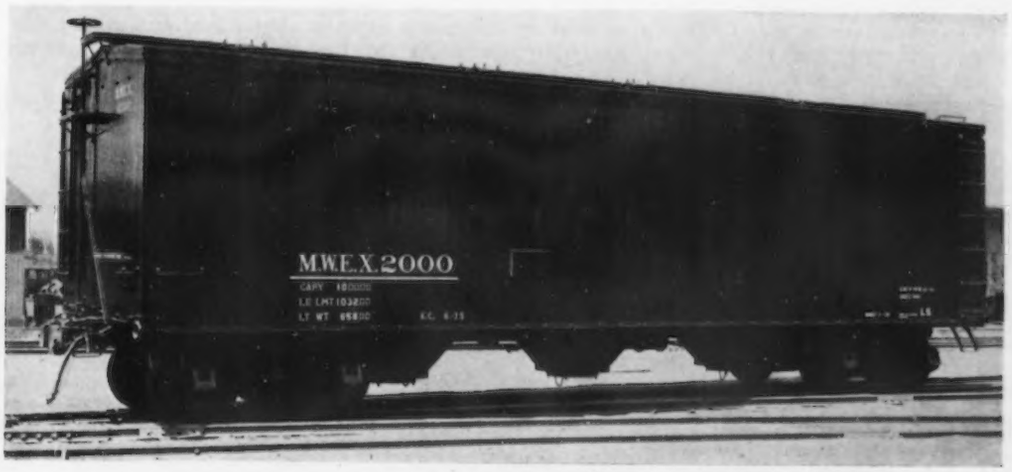
The heads are manually operated and are locked when closed. They have universal adjustment for size. The heavier model is fitted with chaser holders which have an independent adjustment to and from the center. This type of chaser holder insures an equal distribution of the cut.

Design provides a rigid support for the chasers, insuring accurate and well-formed threads. These heads are applicable either to Landis pipe threading and cutting machines or machines of other makes having sufficient clearance.

Projection Welding in Locker Construction

PROJECTION welding is being used at all vital points on an improved line of lockers now being offered by Lyon Metal Products, Inc., Aurora, Ill. This line has been designed to insure the strongest possible construction, and to provide trouble-free operation of the doors. In addition to the above there are refinements of appearance, such as double fluting on the frame members; elimination of bolt heads; and padlock guards are used to keep locks from marring the doors. Lockers of all types are available in the new construction.

Stainless Hoppers Feature New 80,000 Lb. Box Car



A NEW type of box car, with a large portion of the interior constructed of stainles: steel for use in the sugar industry, has been announced by the General American Tank Car Co., Chicago. Unique in design, it boasts of a number of advantages over the conventional car, chief of which is its ability to carry double capacity load, or approximately 80,000 lb. The lining of the vertical sides, as well as that of the roof, is of zinc alloy. The hoppers are fabricated of Allegheny Metal Clad, a stainless steel manufactured by Allegheny Steel Co. The bottom is composed of four hoppers in the shape of inverted pyramids. Eight separate hatches in the roof of the car provide for quick, easy loading, each hatch being carefully insulated to keep out dirt while in transit. The interior surface of the Allegheny metal hopper coming in contact with the sugar is highly polished, with the result that possibility of caking is eliminated, thus assuring a rapid, easy flow of the sugar during the course of unloading and securing freedom from metallic influence or foreign taste.

. . PHILADELPHIA . .

. . . Decrease in inquiries reported.

o o o

. . . Plate business has dropped sharply.

o o o

. . . Operations remain at 55½ per cent of capacity.

PHILADELPHIA, Nov. 2.—Sellers here report that the last week was rather quiet in most finished steel products, and that inquiries have decreased decidedly. Representatives of mills believe that, regardless of the outcome of the election, business in the steel industry will continue good for the remainder of the year, at least.

Except in plates backlogs have not altered appreciably. One mill is now rolling plates on day-to-day orders with no backlog at all. All plate sellers report business slow, since neither of the two largest users of that type flat-rolled products, shipbuilders and pipe makers, has been buying to any extent recently. Demand for sheets continues good and backlogs of from four to eight weeks have been reported. Prompt deliveries may be made in narrow strip, but the wider sizes require from four to eight weeks, and in some cases even longer. Recently, radio builders and stove makers have been specifying strip freely. Structural awards picked up slightly this week, but demand for shapes is generally quiet, with deliveries of from four to eight weeks being quoted by various mills. Deliveries on tin plate have eased a bit from last week, shipments in five or six weeks being possible, although, with 1937 orders beginning to come in now, this schedule may be extended soon.

Edward G. Budd Mfg. Co. reports fabrication last week of 4932 tons of steel, an average of 822 tons daily, and expects this total to be boosted soon from 50 to 100 tons a day. Steel for the models being worked on currently in this plant has been purchased for the remainder of the year, except for a few small lots of miscellaneous material.

Sales to jobbers of pipe and stainless steel are good, and the latter is apparently improving from month to month. One large producer of stainless is said to be booked for the rest of the year and is being forced to turn down orders even from regular customers.

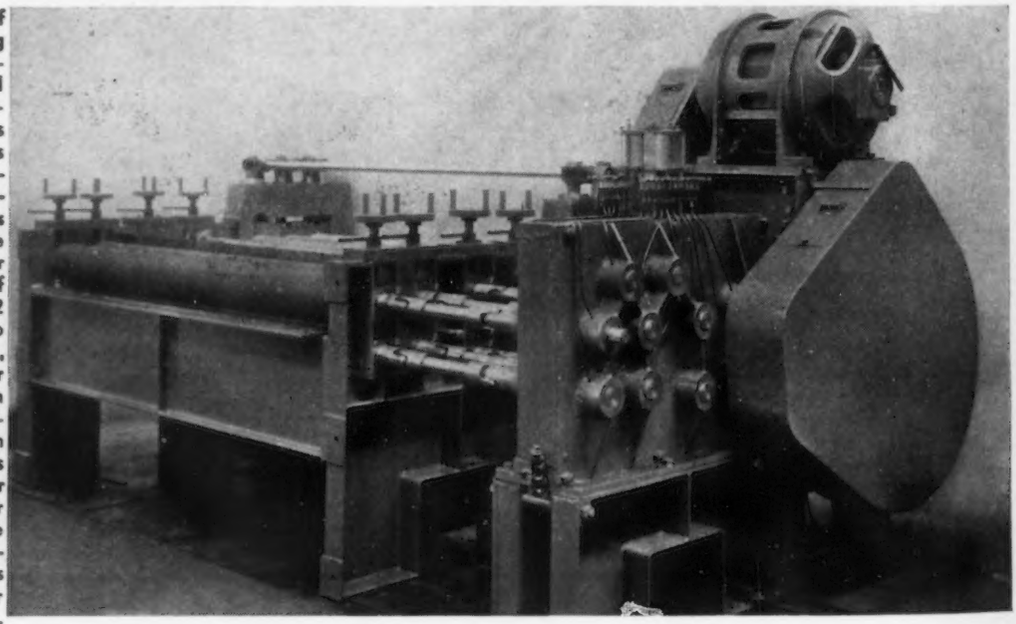
Pig Iron

With the announcement of a $1 per ton advance in price by the Mystic furnace, Everett, Mass., bringing the base there from $20.50 to $21.50, sellers here are beginning to consider seriously the possibility of their prices being increased shortly. District melt is increasing and shipments are improving.

Shapes and Plates

Sheet backlogs have lengthened in some cases recently, and it is difficult to obtain any grade in less than four weeks, while the lighter gages of hot-rolled cannot be secured until the end of the year. Six weeks is required for galvanized deliveries, and four to five weeks for heavy hot-rolled sheets. District plate mills are anxiously awaiting the award of the steel for the Reading car building program, the New York Central locomotives, the Pennsylvania car floats, the Government mine layer reported last week, and two barges for the Chesapeake & Ohio. At this writing nothing definite regarding any of these projects had been announced and plate mills were slowing down for lack of orders. Bald-

INCREASED utility of stainless steel is being found in the development of machinery and machine parts, particularly where corrosion is developed by conditions under which the machines are used. An interesting application is in this machine. The rolls, 5 in. in diameter and 57 in. long, are of Jessop Duro Gloss C2 stainless, made by Jessop Steel Co., Washington, Pa. Copper sheets, after pickling, are run through these rolls for straightening. Even though, in this operation there is a condition of 15 per cent sulphuric and 5 per cent nitric acid, these rolls have been in operation for several years and are still in their original glossy condition.



win Locomotive Works is figuring on five locomotives for the St. Louis-Southwestern, and one each for the Mexican Petroleum Co. and a Colombian railroad.

Wire

Business at the moment is slow. Customers who covered before the price advance are slowly coming back into the market, although users of merchant wire are covered for yet another month. Deliveries range from three to four weeks, and prices are reported firm, although little test has been received on nails.

Shapes and Bars

Structural awards were more numerous this week than for the past month or so, and a few attractive inquiries were reported. Belmont Iron Works received 100 tons of shapes for an addition to the Carney's Point du Pont plant, while Bethlehem Fabricators, Inc., was awarded 100 tons for a Philadelphia theater. Road work continued to hold an important position in the tonnage list, 100 tons going to Bethlehem Steel Co. for a job in Huntingdon County, and a 1200-ton viaduct in Luzerne County being readvertised for bids on Nov. 13. On that same date bids will be taken on two 600-ton projects, one in Armstrong-Westmoreland counties and another in Johnstown, Pa. Reinforcing bars continued quiet.

9,152,384 Tons of Steel Products Made for Sale in Third Quarter

35-400-1.36

AMERICAN IRON AND STEEL INSTITUTE
Capacity and Production for Sale of Iron and Steel Products

Third Quarter - 1936

AIS Form 10

		Number of companies	Items	Annual Capacity Gross tons	Production for Sale—Gross Tons: Current Quarter: Total	Current Quarter: Per cent of capacity	Current Quarter: Shipments: Export	Current Quarter: Shipments: To members of the industry for conversion into further finished products	To Date (9 months 1936): Total	To Date: Per Cent of capacity	To Date: Shipments: Export	To Date: Shipments: To members of the industry for conversion into further finished products
Steel Products	Ingots, blooms, billets, slabs, sheet bars, etc.	33	1	xxxxxxx	929,024	xxx	5,408	621,076	3,381,686	xxx	15,654	2,674,276
	Heavy structural shapes	9	2	5,200,720	666,651	51.3	17,755	-	1,670,012	42.8	42,136	xxxxxxx
	Steel piling	4	3	265,000	31,100	46.9	486	-	81,009	40.8	2,237	xxxxxxx
	Plates—Sheared and Universal	23	4	6,464,549	672,301	41.6	25,014	6,049	1,663,537	34.4	33,691	14,327
	Skelp	8	5	xxxxxxx	175,287	xxx	18,833	103,514	451,941	xxx	35,406	276,797
	Rails—Standard (over 60 lbs.)	4	6	4,075,000	230,330	22.6	4,406	-	867,989	28.4	9,298	xxxxxxx
	Light (60 lbs. and under)	7	7	805,820	21,868	10.9	871	-	66,265	11.0	7,905	xxxxxxx
	All other (Incl. girder, guard, etc.)	2	8	140,000	17,807	50.9	2,306	-	36,029	34.3	4,198	xxxxxxx
	Splice bar and tie plates	15	9	1,608,795	89,176	22.2	255	-	320,668	26.6	2,017	xxxxxxx
	Bars—Merchant	39	10	949,069	xxx	xxx	9,921	106,729	2,618,924	xxx	28,169	252,766
	Concrete reinforcing	30	11	278,797	xxx	xxx	4,709	-	728,059	xxx	10,418	xxxxxxx
	Cold finished—Carbon	18	12	159,695	xxx	xxx	748	-	438,317	xxx	3,856	xxxxxxx
	Alloy—Hot rolled	15	13	156,440	xxx	xxx	1,091	11,566	479,366	xxx	3,214	30,660
	—Cold finished	13	14	xxxxxxx	17,754	xxx	198	-	50,543	xxx	271	xxxxxxx
	Hoops and baling bands	3	15	xxxxxxx	20,139	xxx	781	-	52,664	xxx	1,220	xxxxxxx
	TOTAL BARS	65	16	13,101,600	1,581,894	48.3	17,448	118,295	4,367,873	44.5	47,148	283,426
	Tube rounds	5	17	xxxxxxx	21,616	xxx	-	20,363	63,095	xxx	-	61,267
	Tool steel bars (rolled and forged)	18	18	110,250	9,991	36.2	43	-	28,676	34.7	101	xxxxxxx
	Pipe and tube—B. W	16	19	1,833,999	215,756	47.1	3,755	-	550,547	40.0	11,420	xxxxxxx
	L. W	11	20	1,739,534	165,786	37.7	3,890	-	422,437	32.4	8,969	xxxxxxx
	Electric weld	3	21	813,571	43,469	21.4	73	-	109,484	17.9	237	xxxxxxx
	Seamless	13	22	2,655,978	355,746	53.6	9,036	-	972,685	48.8	19,383	xxxxxxx
	Conduit	6	23	142,350	15,317	43.0	376	-	46,007	43.1	1,054	xxxxxxx
	Mechanical Tubing	5	24	226,900	28,774	50.7	884	-	76,958	45.2	2,298	xxxxxxx
	Wire rods	19	25	xxxxxxx	180,293	xxx	6,661	64,913	501,257	xxx	26,689	194,995
	Wire—Drawn	39	26	1,768,402	295,817	66.5	12,940	5,919	819,338	61.8	35,306	16,146
	—Nails and staples	20	27	1,102,093	125,825	45.7	2,874	-	377,240	45.6	8,919	xxxxxxx
	—Barb., fence, bale ties, fence posts, etc.	24	28	1,334,754	114,700	29.9	10,366	-	382,143	33.2	26,877	xxxxxxx
	Black plate	14	29	459,079	89,680	78.1	1,270	26,279	263,562	76.5	5,340	88,849
	Tin plate	16	30	2,656,680	585,417	87.8	47,127	-	1,568,527	78.7	222,521	xxxxxxx
	Sheets—Hot rolled	21	31	xxxxxxx	421,825	xxx	6,685	13,659	1,166,542	xxx	20,641	85,167
	Hot rolled annealed	23	32	xxxxxxx	462,405	xxx	13,975	510	1,297,051	xxx	35,821	2,499
	Galvanized	17	33	xxxxxxx	298,148	xxx	18,703	-	806,157	xxx	47,550	xxxxxxx
	Cold rolled	19	34	xxxxxxx	421,329	xxx	16,594	-	1,404,413	xxx	54,549	xxxxxxx
	All other	17	35	xxxxxxx	119,269	xxx	3,021	-	351,114	xxx	7,759	xxxxxxx
	TOTAL SHEETS	32	36	8,951,623	1,722,976	77.0	58,978	14,169	5,025,277	74.9	166,320	85,666
	Strip—Hot rolled	30	37	3,586,231	494,185	55.1	9,166	99,264	1,581,168	58.8	30,626	245,797
	Cold rolled	40	38	1,165,733	168,358	57.8	2,140	-	479,255	54.8	8,696	xxxxxxx
	Wheels (car, rolled steel)	5	39	398,284	38,512	38.7	72	-	98,595	33.0	1,136	xxxxxxx
	Axles	4	40	425,900	24,785	23.3	37	-	48,103	15.1	366	xxxxxxx
	Track spikes	11	41	350,260	29,621	33.8	269	-	74,060	28.2	840	xxxxxxx
	All other	5	42	-	16,122	-	2,197	-	23,020	-	5,343	xxxxxxx
	TOTAL STEEL PRODUCTS	156	43	xxxxxxx	9,152,384	xxx	262,956	1,079,841	26,420,419	xxx	802,131	3,941,544
	Estimated total steel finishing capacity based on a yield from ingots of 67.3 %		44	45,265,700	xxxxxxx	71.3	xxxxx	xxxxxxx	xxxxxxx	66.2	xxxxxxx	xxxxxxx
Iron Products	Pig iron, ferro manganese and spiegel	31	45	xxxxxxx	1,441,554	xxx	814	601,852	3,952,415	xxx	2,161	1,352,911
	Ingot moulds	5	46	xxxxxxx	98,255	xxx	854	-	255,661	xxx	2,820	xxxxxxx
	*Plates		47									xxxxxxx
	*Skelp		48									
	Bars	14	49	249,019	14,340	23.0	34	260	46,147	24.7	49	874
	*Splice bars and tie plates		50									xxxxxxx
	Pipe and tubes	4	51	185,457	14,613	31.5	334	-	39,767	28.6	443	xxxxxxx
	*Sheets		52									xxxxxxx
	All other	5	53	151,960	11,116	29.3	77	828	37,321	32.7	498	3,051
	TOTAL IRON PRODUCTS (ITEMS 47 to 53)	18	54	528,476	40,069	30.3	445	1,088	123,235	31.1	990	3,925

* Included in "All Other"

Total Companies included - 181

Total steel products produced for sale, less shipments to members of the industry for conversion into further finished products: Current quarter 8,072,543 *G.T.;* 71.3 *% of Finishing Capacity.*
To date 22,478,875 *G.T.;* 66.2 *% of Finishing Capacity.*
The above tonnages represent 67.3 *% of the ingots produced by companies whose products are included above.*

FABRICATED STEEL

. . . Lettings in better volume at 15,850 tons compared with 9300 tons in the previous week.

o o o

. . . New projects decline to 12,935 tons as against 14,100 tons last week.

o o o

. . . Plate awards only 1110 tons.

NORTH ATLANTIC STATES

Deerfield, Mass., 1800 tons, bridge, to Bethlehem Steel Co.

Monson, Mass., 400 tons, bridge, to Bethlehem Steel Co.

Saugus, Mass., 160 tons, bridge, to Bethlehem Steel Co.

Lynnfield, Mass., 140 tons, State bridge, to Bethlehem Steel Co.

Lebanon, N. H., 370 tons, highway bridge, to American Bridge Co.

Manville, N. J., 345 tons, plant extension, to Savary & Glaeser Co.

Central Park, N. Y., 420 tons, airplane manufacturing building, to Austin Co.

New York, 175 tons, Corning Glass Co. building, to Post & McCord, Inc.

New York, 1000 tons, apartment building, 73rd Street and Riverside Drive, to Harris Structural Steel Co.

Rosebank and New Brighton, Staten Island, 240 tons, bridges for Staten Island Rapid Transit Railway, to American Bridge Co.

Scottsville, N. Y., 320 tons, grade crossing elimination, to Bethlehem Steel Co.

Indiana County, Pa., 520 tons, highway bridges, to American Bridge Co.

Lansdale, Pa., 150 tons, power house addition, to Frank M. Weaver.

Carneys Point, N. J., 120 tons, sulphur color house addition, to Belmont Iron Works.

Homestead, Pa., 120 tons, plate girders for railroad bridge, to American Bridge Co.

Cumberland, Md., 115 tons, Republic Steel Corp. mill building, to Pittsburgh Bridge & Iron Co.

Philadelphia, 100 tons, theater, to Bethlehem Fabricators, Inc.

Huntingdon County, Pa., 100 tons, I-beam spans, highway work, to Bethlehem Steel Co.

SOUTH AND SOUTHWEST

Richmond, Va., 210 tons, addition to parcel post building, to American Bridge Co.

Morgantown, N. C., 210 tons, bridge, to Carolina Steel & Iron Co.

Birmingham, 815 tons, S. H. Kress Co. building, to Ingalls Iron Works Co.

Sheffield, Ala., 295 tons, intake gates. Pickwick Landing dam, to Bethlehem Steel Co.

Holmes County, Miss., 125 tons, bridge, to Vincennes Steel Corp.

Claiborne, Miss., 205 tons, highway bridges, to Virginia Bridge Co.

Randall County, Tex., 140 tons, bridge, to Pittsburgh-Des Moines Steel Co.

Wilbarger County, Tex., 670 tons, flood control system, to Austin Brothers Co.

Houston, Tex., 700 tons, parcel post building, to Pittsburgh-Des Moines Steel Co.

CENTRAL STATES

Yorkville, Ohio, 2550 tons, extensions to buildings, Wheeling Steel Corp., to Bethlehem Steel Co.

Bellevue, Ohio, 220 tons, elimination of Nickel Plate grade crossing, to Bethlehem Steel Co.

Chicago, 445 tons, superstructure for South Ashland Avenue bridge, to American Bridge Co.

East Chicago, Ind., 400 tons, building, to United Boiler & Iron Works.

WESTERN STATES

Denver, 1200 tons, viaduct, to American Bridge Co.

San Francisco, 240 tons, Western Furniture Exchange building, to Bethlehem Steel Co.

Los Angeles, 120 tons, siphon towers, to Consolidated Steel Corp.

Los Angeles, 710 tons, Owens-Illinois plant addition, to Consolidated Steel Corp.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Hancock City, Me., 1250 tons, suspension bridge over Aggemoggin Reach for Deer Isle Bridge Commission.

Biddeford-Saco, Me., 275 tons, State bridge.

Bellows Falls, Vt., 230 tons, repairs to arch span over Connecticut River.

Weedsport, N. Y., 265 tons, grade crossing elimination.

Newark, N. J., 300 tons, buildings for Kreuger Brewing Co.

Luzerne County, Pa., 1200 tons, viaduct; new bids to be taken Nov. 13.

Armstrong-Westmoreland Counties, Pa., 600 tons, highway work; bids Nov. 13.

Johnstown, Pa., 600 tons, Franklin Street bridge; bids Nov. 13.

SOUTH AND SOUTHWEST

Huntington, W. Va., 400 tons, addition to warehouse, Owens-Illinois Glass Co.

Monroe City, Fla., 4100 tons, Florida Keys bridge; D. E. and F. Ruliff, contractors.

State of Texas, 275 tons, bridge over Sabine River for Kansas City Southern Railway.

Oklahoma City, 1650 tons, bridge over Red River; bids Nov. 10.

CENTRAL STATES

Lorain County, Ohio, 600 tons, grade crossing elimination.

Milwaukee, 700 tons, Swift & Co. building.

State of Iowa, 290 tons, highway bridges.

Aberdeen, S. D., 375 tons, post office.

WESTERN STATES

San Francisco, 225 tons, Parker bridge and highway construction; bids Nov. 17.

San Francisco, 800 tons, wharf shed.

FABRICATED PLATES

AWARDS

Toledo, 410 tons, tanks for Pure Oil Co., to Chicago Bridge & Iron Works.

Milwaukee, 700 tons, 79 tanks for Blatz Brewing Co., to Hail Co., Milwaukee.

NEW PROJECTS

Clintonville, Wis., 125 tons, elevated water tank; Chicago Bridge & Iron Works, low bidder.

SHEET PILING

AWARDS

Staten Island, N. Y., 1875 tons of piling and 221 tons of accessories, bulkhead at Marine Park, Great Kills, to Jones & Laughlin Steel Corp.

. . .NON-FERROUS. . .

. . . Domestic lead prices boosted another $2 a ton.

o o o

. . . Copper for export reaches 10.47½c. level; zinc active.

NEW YORK, Nov. 2.—With foreign demand unabated, the export price of electrolytic copper mounted today to as high as 10.47½c. a lb. The view was expressed by a producer here that the present situation was reflective of the type of European buying of copper which characterized the 1913-14 period. Whether for war purposes or otherwise, the rate of inquiry has continued to force export prices up, and, with producers limiting sales at 10c. a lb. to domestic consumers, the possibility exists that a further upward revision in the home market may take place. Total domestic October sales amounted to 178,795 tons, thereby surpassing the July figure.

Lead

Following the advance of $2 a ton on Oct. 27, pig lead prices were boosted another $2 a ton on Oct. 29. The market therefore is currently quotable at 4.80c. a lb., New York, and 4.65c., St. Louis, except that St. Joseph Lead Co. continues to ask a $1 a ton premium on its Eastern business. At the higher levels prevailing, demand for material is unabated, and waiting lists of unsatisfied inquiry remain a feature. Estimates place aggregate shipments of lead in October at between 57,000 and 59,000 tons, and also indicate that refined stocks underwent a reduction of about 20,000 tons.

Zinc

Domestic buying increased during the week, and sales were estimated at around 10,000 tons. The price, however, remains quotably unchanged on the basis of 4.85c., East St. Louis, and producers at the moment appear content to sell freely at that figure. In the foreign market quotations have advanced considerably owing to news of a plan to establish a producers' cartel on the basis of restricting ore output. What ultimately will ensue from this step is conjectural, but its immediate effects, with repercussions upon the domestic situation, have been strengthening. Meanwhile domestic consumption continues strong, and some sources express surprise that a revision in the price has not taken place.

Tin

During the past week tin quotations at New York followed the upward course of the London market, and on Thursday last crossed the 46c. level for the first time in roughly four months. The foreign stimulus was imparted by bullishness regarding renewal of restrictions, Siamese interests last week having agreed to negotiate on a basis more favorable to other signatory countries. Consumers in the home market, however, failed to buy on the advance and trading continued generally quiet. The New York price for spots Straits is easier today at about 45.87½c. a lb., while this morning's London prices were £208 standard cash and £206 5s. three-months. The Eastern quotation was £205 12s. 6d.

Ingot Brass and Bronze

Deliveries of brass and bronze ingots and billets by members of the Non-Ferrous Ingot Metal Institute aggregated 6783 tons in September.

The Week's Prices. Cents Per Pound for Early Delivery

	Oct. 27	Oct. 28	Oct. 29	Oct. 30	Oct. 31	Nov. 2
Electrolytic copper, Conn.*	‡9.75	10.00	10.00	10.00	10.00	10.00
Lake copper, N. Y.	‡9.87½	10.12½	10.12½	10.12½	10.12½	10.12½
Straits tin, Spot, New York	44.45	45.50	46.37½	....	46.00	45.87½
Zinc, East St. Louis	4.85	4.85	4.85	4.85	4.85	4.85
Zinc, New York†	5.22½	5.22½	5.22½	5.22½	5.22½	5.22½
Lead, St. Louis	4.55	4.55	4.65	4.65	4.65	4.55
Lead, New York	4.70	4.70	4.80	4.80	4.80	4.70

* Delivered Connecticut Valley; price ¼c. lower delivered in New York.
† Includes emergency freight charge.
‡ Corrected.

Aluminum, virgin 99 per cent plus 19.00c.-21.00c. a lb. delivered.
Aluminum, No. 12 remelt No. 2 standard, in carloads, 16.50c. a lb. delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 12.50c. a lb., New York.
Quicksilver, $88.00 to $92.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 9.75c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	47.00c. to 48.00c.
Tin, bar	49.00c. to 50.00c.
Copper, Lake	11.00c. to 12.00c.
Copper, electrolytic	11.00c. to 12.00c.
Copper, castings	10.75c. to 11.75c.
*Copper sheets, hot-rolled	17.50c.
*High brass sheets	15.62½c.
*Seamless brass tubes	17.87½c.
*Seamless copper tubes	18.00c.
*Brass rods	13.62½c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	5.10c. to 6.10c.
Lead, bar	6.10c. to 7.10c.
Lead, Sheets, cut	8.25c.
Antimony, Asiatic	13.00c. to 14.00c.
Alum., virgin, 99 per cent plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.50c. to 20.00c.
Solder, ½ and ½	28.50c. to 29.50c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

* These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 33⅓ per cent allowed off for extras, except copper tubes and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	48.37½c.
Tin, Bar	50.37½c.
Copper, Lake	11.00c. to 11.25c.
Copper, electrolytic	11.00c. to 11.25c.
Copper, castings	10.75c. to 11.00c.
Zinc, slabs	6.50c. to 6.75c.
Lead, American pig	5.20c. to 6.50c.
Lead, bar	8.50c.
Antimony, Asiatic	15.00c.
Babbitt metal, medium grade	19.00c.
Babbitt metal, high grade	52.37½c.
Solder, ½ and ½	26.25c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.75c.	8.50c.
Copper, hvy. and wire	7.62½c.	8.12½c.
Copper, light and bottoms	6.62½c.	7.12½c.
Brass, heavy	4.50c.	5.12½c.
Brass, light	3.75c.	4.50c.
Hvy. machine composition	6.50c.	7.00c.
No. 1 yel. brass turnings	5.50c.	6.00c.
No. 1 red brass or compos. turnings	6.12½c.	6.62½c.
Lead, heavy	3.75c.	4.12½c.
Sheet aluminum	13.25c.	14.75c.
Zinc	2.50c.	2.87½c.
Cast aluminum	12.12½c.	13.25c.

IRON AND STEEL SCRAP

. . . Composite advances to $16.58 per gross ton.

o o o

. . . Prices hit a new high at Chicago; advance at Cleveland and Boston.

HOLDERS of scrap all over the country continue to ask better bids for their material. This attitude is a direct reflection both of the probability that mill operations will be maintained at a high level through the turn of the year, and that winter weather will soon reduce collection and preparation of supplies. At Chicago a consumer purchased No. 1 steel at $16.75, which is the highest point reached in that area this year. Additional sales at unchanged price levels are reported at St. Louis, Buffalo, Cleveland and elsewhere, and the Detroit area continues to absorb heavy automobile offers with no weakness in undertone. The important Pittsburgh market remains inactive but has suffered no loss in strength.

Pittsburgh

With practically no activity on the part of brokers and consumers over the past week, this market continues to mark time. One large consumer has removed shipping restrictions and is now accepting delivery. Since the last sale of any importance brought a price of $17.75 for No. 1 steel, this grade is still quotable at $17.25 to $17.75. While some tonnages have gone at $17.50, the amount involved was far from substantial. Market undertone is strong, and it is probable that large sales would bring higher prices. The coming of winter weather and the lack of drastic fall-off in operations contribute toward the maintenance of the strong undertone. Railroad specialties have eased off 50c. in sympathy with the recent downward trend in No. 1 steel.

Chicago

Heavy melting steel has been taken by a mill at $16.75 a gross ton, delivered. This marks a new high for the Chicago area and it is in line with indications which have been noted within the past two weeks. Railroads have disposed of this grade at a new top of $16.90 and there is every indication that strength still prevails. Brokers appear to be playing the market for higher levels, most of them being anxious to take positions on the long side. Old orders are being covered as quickly as possible. Demand for specialties is improved and prices are strong. Rerolling rails are listless for the reason that large users have over bought and are not in need of immediate additional tonnages.

Cleveland

Blast furnace scrap continues very scarce. Prices have advanced another 25c. a ton. Brokers are now paying $11.15 to $11.50 for blast furnace grades for delivery to Cleveland mills. Other grades are unchanged, not being affected by the weakness in the Pittsburgh district. There is a disinclination by brokers to sell and by steel plants to buy scrap at present. Foundry grades are active and firm. Old rails are scarce.

Philadelphia

The market was very quiet this week, and there has been little recent buying. According to some mills, the quantity of scrap coming into their yards is 40 to 50 per cent less than a few weeks ago. Shipments are not being forced, however, and all offerings are being taken wherever made. The present $15.50 to $16 range for No. 1 steel is nominal, no sales being made at $16 for the past two weeks. The market is technically weaker, but only heavy breakable cast and stove plate are being marked down this week. Brokers believe many mills have been delaying orders until after the election and are of the opinion that the next few weeks will see increased buying and a continuation of the price rise. About 3000 tons of hydraulic bundles on the Budd list went to American Bridge Co. at an unstated price.

Buffalo

The market continues strong here though it apparently has fallen off in surrounding districts. The mill which had offered $16 for No. 1 steel and $14.50 for No. 2 has been successful in obtaining about 3500 tons. One of these sales was a lot of 2000 tons and the others made up an aggregate of 1500 tons. A large consumer of cupola cast and stove plate is in the market for an extensive tonnage and is willing to pay $14 to $14.25 for cast and $12.50 for stove plate. These offers so far have not proved attractive to dealers. No. 1 cupola has brought as high as $15 at nearby points.

New York

On the eve of the presidential election, activity in this market is by and large suspended. Handlers as well as consumers of scrap have adopted a waiting attitude, and while prices are unchanged from a week ago there is some testing of the market for possible weakness. Material for export is plainly losing strength.

Detroit

Prices bid on extensive lists issued by Chrysler and Chevrolet last week were well in line with present quotations. Practically all scrap on both lists was taken by out-of-town brokers for water shipment before the season ends. It is felt that most of this buying is to cover old sales contracts. Low phos plate scrap was sold at Chevrolet for over $15 a ton, a price much out of line with the local market, which remains unaffected by this exceptional out-of-town purchase.

St. Louis

The week was marked by a sale of 12,000 tons to two East Side mills, 7000 tons of No. 1 steel to one and 5000 tons of selected grades, mostly specialties to another. These sales are taken to indicate the mills expect some new railroad car buying. The only price change was in No. 2 steel, which advanced 25c. a ton. The Wabash Railway has issued a list of 3500 tons of miscellaneous scrap, but very little of this lot is expected to come into this market.

Cincinnati

Mill refusal to purchase substantial quantities of scrap has weakened the market undertone, although prices are nominally unchanged. There is prominent dealer activity to cover on commitments and to improve yard stocks. Supplies are reported fair, but the trade, in anticipation of estimated market needs, seeks the protection of long positions.

Boston

Current prices for most kinds of scrap are lower than a week ago, but little or no significance is attached to that fact by brokers in general because business just before election came practically to a standstill and since then has shown little life. Almost the only thing moving into Pennsylvania is short bundled cotton ties at not more than $8 a ton, on cars. New England foundries continue to buy machinery and textile cast for which prices remain as heretofore. Like the domestic market, export activity has flattened out. Recent exports included 165 tons for Japan, 3192 tons for Hull, England, 138 tons for Japan, and 166,028 lb. to Germany, the first shipment of any size to that country noted in years.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$17.25 to $17.75
No. 2 hvy. mltng. steel.	15.25 to 15.75
No. 2 RR. wrought.....	17.25 to 17.75
Scrap rails	17.75 to 18.25
Rails, 3 ft. and under..	20.00 to 20.50
Comp. sheet steel	17.25 to 17.75
Hand. bundled sheets..	16.25 to 16.75
Hvy. steel axle turn...	15.75 to 16.25
Machine shop turn....	11.50 to 12.00
Short shov. turn.....	12.00 to 12.50
Mixed bor. & turn.....	11.50 to 12.00
Cast iron borings	12.00 to 12.50
Cast iron carwheels...	17.00 to 17.50
Hvy. breakable cast...	14.50 to 15.00
No. 1 cast	16.00 to 16.50
RR. knuckles & cplrs..	20.00 to 20.50
Rail coil & leaf springs	20.00 to 20.50
Rolled steel wheels....	20.00 to 20.50
Low phos. billet crops.	20.50 to 21.00
Low phos. sh. bar....	20.00 to 20.50
Low phos. punchings..	19.50 to 20.00
Low phos. plate scrap.	19.50 to 20.00
Steel car axles	19.50 to 20.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$15.00 to $15.50
No. 2 hvy mltng. steel.	14.00 to 14.50
Comp. sheet steel	14.50 to 15.00
Light bund. stampings	11.00 to 11.50
Drop forge flashings..	14.00 to 14.50
Machine shop turn....	10.50 to 11.00
Short shov. turn.....	11.00 to 11.50
No. 1 busheling	14.00 to 14.00
Steel axle turnings....	11.00 to 11.50
Low phos. billet crops	19.00 to 19.50
Cast iron borings	11.00 to 11.50
Mixed bor. & turn.....	11.00 to 11.50
No. 2 busheling	11.00 to 11.50
No. 1 cast	16.75 to 17.25
Railroad grate bars...	9.00 to 9.50
Stove plate	9.00 to 9.50
Rails under 3 ft.	19.00 to 19.50
Rails for rolling	16.50 to 17.00
Railroad malleable ...	17.75 to 18.00
Cast iron carwheels...	.... 15.50

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$15.50 to $16.00
No. 2 hvy. mltng. steel.	14.00 to 14.50
Hydraulic bund., new..	15.00 to 15.50
Hydraulic bund., old..	12.50 to 13.00
Steel rails for rolling..	17.00 to 17.50
Cast iron carwheels..	16.50 to 17.00
Hvy. breakable cast...	.... 15.50
No. 1 cast	16.50 to 17.00
Stove plate (steel wks.)	.... 12.50
Railroad malleable ...	.... 16.50
Machine shop turn....	9.50 to 10.00
No. 1 blast furnace...	8.50 to 9.00
Cast borings	8.00 to 8.50
Heavy axle turnings..	12.50 to 13.00
No. 1 low phos. hvy...	20.00 to 20.50
Couplers & knuckles...	19.50 to 20.00
Rolled steel wheels....	19.50 to 20.00
Steel axles	20.50 to 21.00
Shafting	20.50 to 21.00
No. 1 RR. wrought....	16.00 to 16.50
Spec. iron & steel pipe.	13.50 to 14.00
Bundled sheets	14.00 to 14.50
No. 1 forge fire.....	14.50 to 15.00
Cast borings (chem.).	10.50 to 13.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel.....	$16.25 to $16.75
Auto. hvy. mltng. steel.	14.00 to 14.50
Shoveling steel	16.25 to 16.75
Hydraul. comp. sheets.	15.00 to 15.50
Drop forge flashings..	13.50 to 14.00
No. 1 busheling	14.75 to 15.25
Rolled carwheels	18.00 to 18.50
Railroad tires, cut	18.00 to 18.50
Railroad leaf springs..	17.50 to 18.00
Axle turnings	15.00 to 15.50
Steel coup. & knuckles	18.00 to 18.50
Coil springs	19.00 to 19.50
Axle turn. (elec.)	16.00 to 16.50
Low phos. punchings..	18.75 to 19.25
Low phos. plates, 12 in. and under	18.75 to 19.25
Cast iron borings	9.50 to 10.00
Short shov. turnings..	10.50 to 11.00
Machine shop turn....	8.50 to 9.00
Rerolling rails	17.00 to 17.50
Steel rails under 3 ft...	17.00 to 17.50
Steel rails under 2 ft...	18.50 to 19.00
Angle bars, steel	18.00 to 18.50
Cast iron carwheels ..	16.50 to 17.00
Railroad malleable	18.50 to 19.00
Agric. malleable	.... 15.00
	Per Net Ton
Iron car axles	$18.50 to $19.00
Steel car axles	17.75 to 18.25
No. 1 RR. wrought.....	14.25 to 14.75
No. 2 RR. wrought.....	$14.50 to $15.00
No. 2 busheling, old...	6.00 to 6.50
Locomotive tires	13.00 to 13.50
Pipes and flues	8.50 to 9.00
No. 1 machinery cast..	14.00 to 14.50
Clean auto. cast.....	13.00 to 13.50
No. 1 railroad cast....	13.50 to 14.00
No. 1 agric. cast	11.00 to 11.50
Stove plate	8.75 to 9.25
Grate bars	9.50 to 10.00
Brake shoes	10.50 to 11.00

BUFFALO

Per gross ton, f.o.b. consumers' plants:

No. 1 hvy. mltng. steel.	$16.00 to $16.50
No. 2 hvy. mltng. steel.	14.50 to 15.00
Scrap rails	16.00 to 16.50
New hy. b'ndled sheets	14.50 to 15.00
Old hydraul. bundles ..	13.00 to 13.50
Drop forge flashings ...	14.50 to 15.00
No. 1 busheling	14.25 to 15.00
Hvy. axle turnings....	10.50 to 11.00
Machine shop turn....	9.50 to 10.00
Knuckles & couplers..	18.50 to 19.00
Coil & leaf springs....	18.50 to 19.00
Rolled steel wheels....	18.50 to 19.00
Low phos. billet crops.	18.50 to 19.00
Short shov. turnings..	10.25 to 10.75
Mixed bor. & turn.....	10.25 to 10.75
Cast iron borings	10.25 to 10.75
No. 2 busheling	11.00 to 11.50
Steel car axles	17.00 to 17.50
Iron axles	12.00 to 12.50
No. 1 machinery cast..	15.00 to 15.50
No. 1 cupola cast	14.50 to 15.00
Stove plate	12.50 to 13.00
Steel rails under 3 ft..	17.50 to 18.00
Cast iron carwheels...	15.50 to 16.00
Railroad malleable	17.00 to 18.00
Chemical borings	10.50 to 11.00

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel.....	.... $11.50
Scrap steel rails	$12.00 to 12.50
Short shov. turnings..	.... 8.00
Stove plate	.... 8.00
Steel axles	13.50 to 14.00
Iron axles	13.50 to 14.00
No. 1 RR. wrought....	8.50 to 9.00
Rails for rolling	13.50 to 14.00
No. 1 cast	.... 12.50
Tramcar wheels	.... 12.00

ST. LOUIS

Dealer's buying prices per gross ton delivered to consumer:

Selected hvy. steel....	$15.00 to $15.50
No. 1 hvy. melting....	14.50 to 15.00
No. 2 hvy. melting....	13.00 to 13.50
No. 1 locomotive tires..	13.50 to 14.00
Misc. stand.-sec. rails.	15.25 to 15.75
Railroad springs	16.50 to 17.00
Bundled sheets	9.50 to 10.00
No. 2 RR. wrought ...	14.50 to 15.00
No. 1 busheling	8.50 to 9.00
Cast bor. & turn.....	5.50 to 6.00
Rails for rolling	15.75 to 16.25
Machine shop turn....	4.00 to 4.50
Heavy turnings	10.50 to 11.00
Steel car axles	17.00 to 17.50
Iron car axles	18.00 to 18.50
No. 1 RR. wrought....	12.50 to 13.00
Steel rails under 3 ft...	16.00 to 16.50
Steel angle bars.....	15.50 to 16.00
Cast iron carwheels...	13.50 to 14.00
No. 1 machinery cast.	12.50 to 13.00
Railroad malleable	15.50 to 16.00
No. 1 railroad cast....	12.50 to 13.00
Stove plate	7.50 to 8.00
Agricul. malleable	12.50 to 13.00
Grate bars	9.00 to 9.50
Brake shoes	11.25 to 11.75

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$14.00 to $14.50
No. 2 hvy. mltng. steel.	11.50 to 12.00
Scrap rails for mltng.	14.00 to 14.50
Loose sheet clippings..	8.50 to 9.00
Bundled sheets	10.50 to 11.00
Cast iron borings	6.50 to 7.00
Machine shop turn.....	7.50 to 8.00
No. 1 busheling	11.00 to 11.50
No. 2 busheling	6.50 to 7.00
Rails for rolling	15.00 to 15.50
No. 1 locomotive tires..	12.50 to 13.00
Short rails	17.00 to 17.50
Cast iron carwheels....	13.50 to 14.00
No. 1 machinery cast..	14.00 to 14.50
No. 1 railroad cast....	13.50 to 14.00
Burnt cast	9.50 to 10.00
Stove plate	9.50 to 10.00
Agricult. malleable ...	13.00 to 13.50
Railroad malleable	15.00 to 15.50

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$13.25 to $13.75
No. 2 hvy. mltng. steel.	12.25 to 12.75
Borings and turnings..	9.00 to 9.50
Long turnings	$8.50 to $9.00
Short shov. turnings..	10.00 to 10.50
No. 1 machinery cast..	14.50 to 15.00
Automotive cast	14.50 to 15.00
Hydraul. comp. sheets.	14.00 to 14.50
Stove plate	8.50 to 9.00
New factory bushel ...	12.75 to 13.25
Old No. 2 busheling ..	8.25 to 8.75
Sheet clippings	10.00 to 10.50
Flashings	12.50 to 13.00
Low phos. plate scrap.	13.75 to 14.25

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
No. 1 hvy. mltng. steel.	$10.75	$10.50
No. 2 hvy. mltng. steel.	9.75	9.25
Mixed dealers steel	7.75	7.75
Scrap pipe	6.75	6.50
Steel turnings	4.25	4.25
Cast iron turnings	4.75	4.50
Machinery cast	11.75	11.00
Dealers cast	10.75	10.00
Stove plate	7.25	6.75

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$17.00 to $17.50
Hydraulic bundles	16.50 to 17.00
Machine shop turn.....	12.00 to 12.50

NEW YORK

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$11.50 to $12.00
No. 2 hvy. mltng. steel.	10.25 to 10.75
Hvy. breakable cast...	11.00 to 11.50
No. 1 machinery cast.	12.00 to 12.50
No. 2 cast	10.50 to 11.00
Stove plate	.... 10.00
Steel car axles	16.00 to 17.00
Shafting	15.00 to 16.00
No. 1 RR. wrought ...	12.00 to 12.50
No. 1 wrought long....	11.00 to 11.50
Spec. iron & steel pipe	10.50 to 11.00
Forge fire	8.00 to 8.50
Rails for rolling	11.50 to 12.00
Short shov. turnings..	5.75 to 6.25
Machine shop turn.....	6.25 to 6.50
Cast borings	6.25 to 6.50
No. 1 blast furnace....	5.00 to 5.50
Cast borings (chem.)..	10.00 to 11.00
Unprepar. yard scrap.	6.50 to 7.00

Per gross ton, delivered local foundries:

No. 1 machn. cast.....	$14.00 to $14.50
No. 1 hvy. cast cupola.	11.50 to 12.00
No. 2 cast	10.50 to 11.00

Add 25c. to 50c. to above quotations to secure North Jersey prices.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$10.75 to $11.00
Scrap rails	11.00 to 11.25
No. 2 steel	8.75 to 9.00
Breakable cast	10.00 to 10.25
Machine shop turn.....	.... 5.50
Bund. skeleton long...	.... 9.50
Shafting	15.00 to 15.25
Cast bor. chemical.....	6.00 to 7.00

Per gross ton delivered consumers' yards:

Textile cast	$12.00 to $13.50
No. 1 machine cast ..	12.00 to 13.50
Stove plate.....	9.50 to 10.00

EXPORT

Brokers' buying prices per gross ton:

New York, delivered alongside barges

No. 1 hvy. mltng. steel.	$11.50 to $11.75
No. 2 hvy. mltng. steel.	10.50 to 10.75
No. 2 cast	.... 10.00
Stove plate	.... 10.00
Rails (scrap)	11.50 to 12.00

Boston on cars at Army Base or Mystic Wharf

No. 1 heavy melting steel.....	$12.00
No. 2 heavy melting steel.....	11.00
Rails (scrap)	12.50
Stove plate	7.75
Machine shop turn.....	6.00

New Orleans, on cars at Stuyvesant Dock

No. 1 hvy. mltng. steel.	$12.60 to $12.75
No. 2 hvy. mltng. steel.	11.60 to 11.75

Los Angeles, on cars or trucks at local piers

No. 1 hvy. mltng. steel.	$10.50 to $11.00
Compressed bundles ..	8.50 to 9.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are $2 a ton higher, and delivered Detroit $3 higher.

	Per Gross Ton
Rerolling	$32.00
Forging quality	39.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$32.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.80c.

Wire Rods

(No. 5 to 15/32 in.)

	Per Gross Ton
F.o.b. Pittsburgh or Cleveland	$40.00
F.o.b. Chicago, Youngstown or Anderson, Ind.	41.00
F.o.b. Worcester, Mass.	42.00
F.o.b. Birmingham	43.00
F.o.b. San Francisco	49.00
F.o.b. Galveston	46.00

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago or Gary	2.10c.
F.o.b. Duluth	2.20c.
Del'd Detroit	2.20c.
F.o.b. Cleveland	2.10c.
F.o.b. Buffalo	2.15c.
Del'd Philadelphia	2.36c.
Del'd New York	2.40c.
F.o.b. Birmingham	2.20c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars Pacific ports	2.60c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh	1.90c.
F.o.b. Cleveland, Chicago, Gary or Moline, Ill.	1.95c.
F.o.b. Buffalo	2.00c.
F.o.b. Birmingham	2.05c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.45c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh	2.05c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.10c.
Del'd Detroit	2.20c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh	1.90c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.30c.

Iron

F.o.b. Chicago	1.80c.
F.o.b. Pittsburgh (refined)	2.10c.
Delivered New York	2.05c.
Delivered Philadelphia	2.10c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	2.35c.
F.o.b. Cleveland, Chicago and Gary	2.40c.
F.o.b. Buffalo	2.45c.
Del'd Detroit	2.50c.
Del'd eastern Michigan	2.55.c

*In quantities of 10,000 to 19,999 lb.

Plates

	Base per Lb.
F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago or Gary	1.95c.
Del'd Cleveland	2.095c.
F.o.b. Coatesville or Spar. Pt.	2.00c.
Del'd Philadelphia	2.09c.
Del'd New York	2.19c.
F.o.b. Birmingham	2.05c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.45c.
Wrought iron plates, f.o.b. Pittsburgh	3.20c.

Floor Plates

F.o.b. Pittsburgh	3.45c.
F.o.b. Chicago	3.50c.
F.o.b. Coatesville	3.55c.
F.o.b. cars dock Gulf ports	3.85c.
F.o.b. cars dock Pacific ports	4.00c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago	1.95c.
Del'd Cleveland	2.095c.
F.o.b. Buffalo or Bethlehem	2.00c.
Del'd Philadelphia	2.115c.
Del'd New York	2.1625c.
F.o.b. Birmingham (standard)	2.05c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.45c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.25c.
F.o.b. Chicago or Buffalo	2.35c.
F.o.b. cars dock Gulf or Pacific Coast ports	2.70c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb per gross ton	$36.37½
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	$35.00
Light rails (from rail steel) per gross ton	34.00

	Base per 100 Lb.
Spikes	2.75c.
Tie plates, steel	2.00c.
Tie plates, Pacific Coast ports	2.10c.
Track bolts, to steam railroads	3.75c.
Track bolts, to jobbers, all sizes (per 100 counts)	70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE, TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.95c.
No. 10, f.o.b. Gary	2.05c.
No. 10, del'd Detroit	2.15c.
No. 10, del'd Philadelphia	2.26c.
No. 10, f.o.b. Birmingham	2.10c.
No. 10, f.o.b. cars dock Pacific ports	2.50c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.60c.
No. 24, f.o.b. Gary	2.70c.
No. 24, del'd Detroit	2.80c.
No. 24, del'd Philadelphia	2.91c.
No. 24, f.o.b. Birmingham	2.75c.
No. 24, f.o.b. cars dock Pacific ports	3.25c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.60c.
No. 10 gage, f.o.b. Gary	2.70c.
No 10 gage, f.o.b. Detroit	2.80c.
No. 10 gage, del'd Philadelphia	2.91c.
No. 10 gage, f.o.b. Birmingham	2.75c.
No. 10 gage, f.o.b. cars dock Pacific ports	3.20c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	3.05c.
No. 20 gage, f.o.b. Gary	3.15c.
No. 20 gage, del'd Detroit	3.25c.
No. 20 gage, del'd Philadelphia	3.36c.
No. 20 gage, f.o.b. Birmingham	3.20c.
No. 20 f.o.b. cars dock Pacific ports	3.60c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.20c.
No. 24, f.o.b. Gary	3.30c.
No. 24, del'd Philadelphia	3.51c.
No. 24, f.o.b. Birmingham	3.35c.
No. 24, f.o.b. cars dock Pacific ports	3.80c.
No. 24, wrought iron, Pittsburgh	4.95c.

Electrical Sheets

(F.o.b. Pittsburgh)

	Base per Lb.
Field grade	3.00c.
Armature	3.35c.
Electrical	3.85c.
Special Motor	4.90c.
Special Dynamo	5.60c.
Transformer	6.10c.
Transformer Special	7.10c.
Transformer Extra Special	7.60c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extras, plus 25c. per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.50c.
F.o.b. Gary	3.60c.
F.o.b. cars dock Pacific ports	4.20c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.05c.
No. 20, f.o.b. Gary	3.15c.
No. 20, f.o.b. Birmingham	3.65c.
No. 20, f.o.b. cars dock Pacific ports	3.65c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock Pacific ports	3.35c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. Pittsburgh district mill	$5.25
Standard cokes, f.o.b. Gary	5.35

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., P'gh.	1.95c.
All widths up to 24 in., Chicago	2.05c.
All widths up to 24 in., del'd Detroit	2.15c.
All widths up to 24 in., Birmingham	2.10c.
Cooperage stock, Pittsburgh	2.05c.
Cooperage stock, Chicago	2.15c.

Cold-Rolled Strips*

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.895c.
F.o.b. Worcester	2.80c.

* Carbon 0.25 and less.

Cold-Rolled Spring Steel

	Pittsburgh and Cleveland	Worcester
Carbon 0.25-0.50%	2.60c.	2.80c.
Carbon .51- .75	3.70c.	3.90c.
Carbon .76-1.00	5.45c.	5.65c.
Carbon Over 1.00	7.50c.	7.70c.

Fender Stock

No. 14, Pittsburgh or Cleveland	2.90c.
No. 14, Worcester	3.30c.
No. 20, Pittsburgh or Cleveland	3.30c.
No. 20, Worcester	3.70c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade

	Per Lb.
Bright wire	2.50c.
Spring wire	3.05c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To the Trade

	Base per Keg
Standard wire nails	$2.05
Smooth coated nails	2.05

	Base per 100 Lb.
Annealed fence wire	$2.80
Galvanized fence wire	3.15
Polished staples	2.75
Galvanized staples	3.00
Barbed wire, galvanized	2.55
Twisted barbless wire	2.55
Woven wire fence, base column	60
Single loop bale ties, base column	52

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., mill prices are $2 a ton over Pittsburgh except for woven wire fence, which is $3 over Pittsburgh and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel In.	Black	Galv.	*Wrought Iron* In.	Black	Galv.
⅛	57	37	⅛	+91½	+138
¼ to ⅜	60	44½	¼ & ⅜	+1½	+21½
½	64½	55	½	31½	15
¾	67½	59	¾	36½	20½
1 to 3	69½	61½	1 & 1¼	39½	25½
			1½	43½	28
			2	41½	26

Lap Weld

2	62	53½	2	37	22½
2½ to 3	65	56½	2½ to 3½	38	25
3½ to 6	67	58½	4 to 8	40	28½
7 & 8	66	56½	9 to 12	38	24½
9 & 10	65½	56			
11 & 12	64½	55			

Butt Weld, extra strong, plain ends

⅛	55½	42½	⅛	+13	+45½
¼ to ⅜	57½	46½	¼ & ⅜	+2½	+34½
½	62½	54½	½	32½	17½
¾	66½	58½	¾	37½	22½
1 to 3	68	61	1 to 2	43½	29

Lap Weld, extra strong, plain ends

2	60	52½	2	40	26
2½ to 3	64	56½	2½ to 4.45	41½	33
3½ to 6	67½	60	4½ to 6.45		33½
7 & 8	66½	57	7 & 8	46	33
9 & 10	65½	56	9 to 12	41½	30
11 & 12	64½	55			

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 8.60	$ 7.82
1¼ in. o.d.	13 B.W.G.	10.19	9.26
1½ in. o.d.	13 B.W.G.	11.26	10.23
1¾ in. o.d.	13 B.W.G.	12.81	11.64
2 in. o.d.	13 B.W.G.	14.35	13.04
2¼ in. o.d.	13 B.W.G.	16.00	14.54
2½ in. o.d.	12 B.W.G.	17.61	16.01
2¾ in. o.d.	12 B.W.G.	19.29	17.54
3¾ in. o.d.	12 B.W.G.	20.45	18.59
3 in. o.d.	12 B.W.G.	$21.45	$19.50
4½ in. o.d.	10 B.W.G.	41.08	37.35
3½ in. o.d.	11 B.W.G.	27.09	24.62
4 in. o.d.	10 B.W.G.	33.60	30.54
4½ in. o.d.	10 B.W.G.	41.08	37.35
5 in. o.d.	9 B.W.G.	51.56	46.87
6 in. o.d.	7 B.W.G.	79.15	71.90

Extra for less-carload quantities:

25,000 lb.	or ft.	to 39,999	lb.	or ft.	5 %
12,000 lb.	or ft.	to 24,999	lb.	or ft.	12½%
6,000 lb.	or ft.	to 11,999	lb.	or ft.	25 %
2,000 lb.	or ft.	to 5,999	lb.	or ft.	35 %
Under 2,000 lb.	or ft.				50 %

CAST IRON WATER PIPE

Per Net Ton

*6-in. and larger, del'd Chicago.	$48.40
6-in. and larger, del'd New York	45.20
*6-in. and larger, Birmingham	40.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	48.00
F.o.b. dock, Seattle	40.50
F.o.b. dock, Seattle	51.50

Class "A" and gas pipe, $3 extra.
4-in. pipe is $3 a ton above 6-in.

* Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $39. Birmingham, and $47.40, delivered Chicago and 4-in. pipe, $42, Birmingham, and $50.40 a ton, delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:	
½ in. x 6 in. and smaller	70 and 10
Larger than ½ in	70 and 5
Lag bolts	70 and 5
Plow bolts, Nos. 1, 2, 3, and 7 heads	70 and 5
Hot-pressed nuts, blank or tapped, square	70 and 5
Hot-pressed nuts, blank or tapped, hexagon	70 and 5
C.p.c. and t. square or hex. nuts, blank or tapped	70 and 5
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes	60, 20 and 10
Stove bolts in packages, nuts attached	75
Stove bolts in packages, with nuts separate	75 and 5
Stove bolts in bulk	82½
Tire bolts	50 and 5

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland	$3.05
F.o.b. Chicago or Birmingham	3.15

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh	70 and 5
F.o.b. Cleveland	70 and 5
F.o.b. Chicago and Birm'g'm.	70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller	50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread ¾ in. and smaller	75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller	60
Upset set screws, cup and oval points	75
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $51 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base..... 2.55c.
Delivered price at Detroit is.. 2.70c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (½% Nickel)	$0.25
2100 (2½% Nickel)	0.95
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30) Molybdenum (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.10c.
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.40
Carbon Vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric turned steel is 50c. higher. The differential for cold-drawn bars ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.05c. base per lb. Delivered Detroit, 3.20c.

STAINLESS STEEL No. 302

(17 to 19% Cr, 7 to 9% Ni, 0.08 to 0.20% C.)

(Base Prices f.o.b. Pittsburgh)

	Per Lb.
Forging billets	19.55c.
Bars	23c.
Plates	26c.
Structural shapes	23c.
Sheets	33c.
Hot-rolled strip	20¾c.
Cold-rolled strip	27c.
Drawn wire	23c.

TOOL STEEL

	Base per Lb.
High speed	57½c.
High carbon chrome	37c.
Oil hardening	21c.
Special	19c.
Extra	15¾c.
Regular	12½c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports
Based on Exchange rate as of Oct. 6

Ferromanganese, export	$45.53
Billets, open-hearth	29.74 to $31.01
Tin plate, per base box	4.74 to 4.84
Steel bars, open-hearth	39.87
Beams, open-hearth	38.61
Channels, open-hearth	39.87
Angles, open-hearth	38.61
Black sheets, No. 24 gage	51.66
Galvanized sheets, No. 24 gage	61.50

CONTINENTAL

Per Metric Ton, f.o.b. Continental Ports
Based on Exchange rate of Oct. 6

Billets, Thomas	$19.27
Wire rods, No. 5 B.W.G.	36.90
Steel bars, merchant	26.64
Sheet bars	19.68
Plate, ¼ in. and up	35.42
Plate, 3/16 in. and 5 mm.	34.85
Sheets, ⅛ in.	36.90
Beams, Thomas	25.58
Angles (Basic)	25.58
Hoops and strip base	32.79
Wire, plain, No. 8	44.03
Wire nails	47.15
Wire, barbed, 4 pt. No. 10 B.W.G.	71.74

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH

	Base per Lb.
Plates	3.25c.
Structural shapes	3.25c.
Soft steel bars and small shapes	3.15c.
Reinforcing steel bars	3.15c.
Cold-finished and screw stock:	
Rounds and hexagons	3.60c.
Squares and flats	3.60c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	3.30c.
Hoops	3.80c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.45c.
Galv. sheets (No. 24), 25 or more bundles	4.05c.
Hot-rolled sheets (No. 10)	3.05c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.77
Spikes, large	3.25c.

	Per Cent Off List
Track bolts, all sizes, per 100 count	60
Machine bolts, 100 count	65-5
Carriage bolts, 100 count	65-5
Nuts, all styles, 100 count	65-5
Large rivets, base per 100 lb.	$3.65
Wire, black, soft ann'l'd, base per 100 lb.	3.05c.
Wire, galv. soft, base per 100 lb.	3.40c.
Common wire nails, per keg	2.30c.
Cement coated nails, per keg.	2.30c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes.	3.30c.
Soft steel bars, rounds	3.20c.
Soft steel bars, squares and hexagons	3.35c.
Cold-fin. steel bars:	
Rounds and hexagons	3.75c.
Flats and squares	3.75c.
Hot-rolled strip	3.40c.
Hot-rolled annealed sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.65c.
Spikes (keg lots)	3.85c.
Track bolts (keg lots)	4.85c.
Rivets, structural (keg lots)	3.80c.
Rivets, boiler (keg lots)	3.90c.

	Per Cent Off List
Machine bolts	*65
Carriage bolts	*65
Lag screws	*65
Hot-pressed nuts, sq. tap or blank	*65
Hot-pressed nuts, hex. tap or blank	*65
Hex. head cap screws	87½
Cut point set screws	75 and 10
Flat head bright wood screws	70
Spring cotters	55
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	$4.50 off list
Black ann'l'd wire per 100 lb.	$3.95
Com. wire nails, 50 kegs or more	2.40c.†
Cement c't'd nails, 50 kegs or more	2.40c.†

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants wihtin the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

†Prices for city and suburbs only.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	3.50c.
Structural shapes	3.47c.
Soft steel bars, rounds	3.51c.
Iron bars, Swed. charcoal	6.75c. to 7.00c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.06c.
Flats and squares	4.06c.
Cold-rolled; strip, soft and quarter hard	3.36c.
Hoops	3.66c.
Bands	3.66c.
Hot-rolled sheets (No. 10)	3.15c. to 3.41c.
Hot-rolled ann'l'd sheets (No. 24*)	3.75c. to 4.10c.
Galvanized sheets (No. 24*)	4.10c. to 4.50c.
Long terne sheets (No. 24)	5.25c. to 5.35c.
Armco iron, galv. (No. 24†)	5.65c.
Toncan iron, galv. (No. 24†)	5.65c.
Galvannealed (No. 24†)	5.75c.
Armco iron, hot-rolled annealed (No. 24†)	5.10c.
Toncan iron, hot-rolled annealed (No. 24†)	5.10c.
Armco iron hot-rolled (No. 10†)	4.15c.
Toncan iron, hot-rolled (No. 10†)	4.15c.
Cold-rolled sheets (No. 20) less than 1000 lbs.	
Standard quality	4.65c.
Deep drawing	5.40c.
Stretcher leveled	5.40c.
SAE, 2300, hot-rolled	6.97c.
SAE, 3100, hot-rolled	5.37c.
SAE, 6100, hot-rolled, annealed	9.57c.
SAE, 2300, cold-rolled	8.03c.
SAE, 3100, cold-rolled, annealed	7.43c.
Floor plate ⅛ in. and heavier	5.30c.
Standard tool steel	11.25c.
Wire, black annealed (No. 9).	3.50c.
Wire, galv. (No. 9)	3.85c.
Tire steel, 1 x ½ in. and larger	3.85c.
Open-hearth spring steel	4.00c. to 10.00c.
Common wire nails, base per keg	$3.21

	Per Cent Off List
Machine bolts, square head and nut:	
All diameters	65 and 10
Carriage bolts, cut thread:	
All diameters	65 and 10

* No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

† 125 lb. and more.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.55c.
Bars, soft steel (rounds and flats)	3.45c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.60c.
Cold-fin. rounds, shafting, screw stock	4.00c.
Hot-rolled annealed sheets (No. 24)	4.30c.
Galv. sheets (No. 24)	4.90c.
Hot-rolled sheets (No. 10)	3.40c.
Black corrug. sheets (No. 24)	4.30c.
*Galv. corrug. sheets	4.90c.
Structural rivets	4.15c.
Boiler rivets	4.25c.

	Per Cent Off List
Tank rivets, 7/16 in. and smaller.	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities	65

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	3.10c.
*Structural shapes	3.10c.
*Soft steel bars, small shapes, iron bars (except bands)	3.25c.
‡Reinforc. steel bars, sq. twisted and deformed	3.01c.
Cold-finished steel bars	4.01c.
*Steel hoops	3.55c.
*Steel bands, No. 12 and 3/16 in. incl.	3.30c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	3.85c.
†Galvanized sheets (No. 24)	4.50c.
*Hot-rolled annealed sheets (No. 10)	3.20c.
Diam. pat. floor plates, ¼ in.	5.05c.
Swedish iron bars	6.25c.

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.41c.
Soft steel bars	3.10c.
‡Reinforc. steel bars	2.10c.
†Cold-finished steel bars	3.75c.
Flat-rolled steel under ¼ in.	3.46c.
Cold-finished strip	†3.00c.
Hot-rolled annealed sheets (No. 24)	3.91c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.21c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.46c.
*Black ann'l'd wire, per 100 lb.	$2.80
*No. 9 galv. wire, per 100 lb.	3.15
*Com. wire nails, base per keg	2.25

†Outside delivery 10c. less.

*For 5000 lb. or less.

‡Plus switching and cartage charges and quantity differentials up to 50c.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.52c.
Floor plates	5.27c.
Bars, rounds, flats and angles.	3.42c.
Other shapes	3.57c.
Rail steel reinforc. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.57c.
Cold-finished bars	3.97c.
Hot-rolled annealed sheets (No. 24) 25 bundles or more.	3.72c.
Galv. sheets (No. 24) 3750 lb. or more	4.07c.
Galvanized sheets (No. 24) over 3500 lb.	4.07c.
Hot-rolled sheets (No. 10)	3.32c.
Structural rivets	4.50c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.88
Com. wire nails, base per keg:	
Any quantity less than carload.	3.04
Cement c't'd nails, base 100-lb keg	3.50
Chain. lin. per 100 lb	8.35

	Net per 100 Ft.
Seamless steel boiler tubes,	
2-in.	$20.37
4-in.	48.14
Lap-welded steel boiler tubes,	
2-in.	19.38
4-in.	45.32

BUFFALO

	Base per Lb.
Plates	3.48c.
Struc. shapes	3.35c.
Soft steel bars	3.25c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.80c.
Rounds and hex.	3.80c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.26c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.53c.
Galv. sheet (No. 24)	4.80c.
Bands	3.53c.
Hoops	3.53c.
Heavy top-rolled sheets	3.28c.
Com. wire nails, base per keg.	$2.35
Black wire, base per 100 lb. (2500-lb. lots or under)	4.00
(Over 2500 lb.)	3.90

BOSTON

	Base per Lb.
Channels, angles	3.65c.
Tees and zees, under 3"	3.90c.
H beams and shapes	3.64c.
Plates — Sheared, tank, and univ. mill, ¼ in. thick and heavier	3.66c.
Floor plates, diamond pattern	5.46c.
Bar and bar shapes (mild steel)	3.65c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.75c. to 4.75c.
Half rounds, half ovals, ovals and bevels	4.90c.
Tire steel	4.90c.
Cold-rolled strip steel	2.45c.
Cold-finished rounds, squares and hexagons	4.15c.
Cold-finished flats	4.10c.
Blue annealed sheets, No. 10 ga.	3.75c.
One pass cold-rolled sheets No. 24 ga.	4.30c.
Galvanized steel sheets, No. 24 ga.	4.30c.
Lead coated sheets, No. 24 ga.	5.95c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

Base per Lb.

Soft steel bars	3.29c.
Structural shapes	3.52c.
Plates	3.52c.
Floor plates	5.27c.
Hot-rolled annealed sheets (No. 24)*	4.14c.
Hot-rolled sheets (No. 10)**	3.24c.
Galvanized sheets (No. 24)	4.82c.
Bands	3.49c.
Hoops	3.49c.
†Cold-finished bars	3.84c.
Cold-rolled strip	3.18c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	5.44c.
Bolts and nuts, in cases, 70 and 10 per cent off list	
Broken cases..65 and 10 per cent off	

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

* Base less 0.25c., 3500 lb. and over. Add 0.50c. per hundred lb. for broken bundles.

** Base less 0.25c., 1500 to 3749 lbs.; less 0.50c., 3750 to 7499 lb.; less 0.75c., 7500 lb. and over.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

Country territory to be equalized on the Chicago plan.

MILWAUKEE

Base per Lb.

Plates and structural shapes	3.41c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.31c.
Soft steel bars, squares and hexagons	3.46c.
Hot-rolled strip	3.51c.
Hot-rolled sheets (No. 10)	3.26c.
Hot-rolled annealed sheets (No. 24)	4.16c.
Galvanized sheets (No. 20)	4.76c.
Cold-finished steel bars	3.76c.
Cold-rolled strip	3.33c.
Structural rivets (keg lots)	4.01c.
Boiler rivets, cone head (keg lots)	4.11c.
Track spikes (keg lots)	4.06c.
Track bolts (keg lots)	5.06c.
Black annealed wire	3.40c.
Com. wire nails	2.60c.
Cement coated nails	2.60c.

Per Cent Off List

Machine bolts carriage bolts and lag screws	70 to 75
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	70

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

Base per Lb.

Mild steel bars, rounds	3.45c.
Structural shapes	3.55c.
Plates	3.55c.
Cold-finished bars	4.00c.
Bands and hoops	3.65c.
Hot-rolled annealed sheets, No. 24	4.30c.
Galvanized sheets, No. 24	4.90c.

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

Base per Lb.

Mild steel bars and small shapes	3.10c.
Structural shapes	3.10c.
Reinforcing bars	....prices on application
Plates	3.10c.
Hot-rolled sheets, No. 10	3.20c.
Bands	3.30c.
Hoops	3.55c.
Special threading steel	3.20c.
Diamond pattern floor plates ¼ in. and heavier	5.10c.
Galvanized bars and small shapes	5.60c.
Galvanized bands	5.80c.
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	3.88c.

All prices are for 2000 lb. and more.

For second zone add 10c. per 100 lb. for trucking.

List size extras of Aug. 15, 1935, and cutting extras to be added.

For cold-rolled products, list size extras from Jan. 1, 1936, and cutting extras to be added.

CHATTANOOGA

Base per Lb.

Mild steel bars	3.46c.
Iron bars	3.46c.
Reinforcing bars	3.46c.
Structural shapes	3.66c.
Plates	3.66c.
Hot-rolled sheets No. 10	3.46c.
Hot-rolled annealed sheets, No. 24*	3.41c.
Galvanized sheets No. 24*	3.96c.
Steel bands	3.71c.
Cold-finished bars	4.281c.

* Plus mill item extra.

MEMPHIS

Base per Lb.

Mild steel bars	3.57c.
Shapes, bar size	3.57c.
Iron bars	3.57c.
Structural shapes	3.77c.
Plates	3.77c.
Hot-rolled sheets, No. 10	3.57c.
Hot-rolled annealed sheets, No. 24	4.37c.
Galvanized sheets, No. 24	5.07c.
Steel bands	3.82c.
Cold-drawn rounds	4.04c.
Cold-drawn flats, squares, hexagons	6.04c.
Structural rivets	4.25c.
Bolts and nuts, per cent off list	65
Small rivets, per cent off list	50

NEW ORLEANS

Base per Lb.

Mild steel bars	3.45c.
Reinforcing bars	3.50c.
Structural shapes	3.65c.
Plates	3.65c.
Hot-rolled sheets, No. 10	3.65c.
Hot-rolled annealed sheets, No. 24	4.35c.
Galvanized sheets, No. 24	4.95c.
Steel bands	4.05c.
Cold-finished steel bars	4.55c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	$2.45
Bolts and nuts, per cent off list	70

PACIFIC COAST

Base per Lb.

	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.60c.	3.80c.	3.65c.
Shapes, standard	3.60c.	3.80c.	3.65c.
Soft steel bars	3.60c.	3.80c.	3.90c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.45c.	2.45c.	2.45c.
Hot-rolled annealed sheets (No. 24)	4.30c.	4.35c.	4.60c.
Hot-rolled sheets (No. 10)	3.70c.	3.90c.	3.85c.
Galv. sheets (No. 24 and lighter)	5.00c.	4.60c.	5.00c.
Galv. sheets (No. 22 and heavier)	5.00c.	4.80c.	5.00c.
Cold finished steel			
Rounds	6.05c.	6.10c.	6.00c.
Squares and hexagons	7.30c.	7.35c.	6.35c.
Flats	7.80c.	7.85c.	7.35c.
Common wire nails—base per keg less carload	$2.90	$2.90	$2.90

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

Per 1000 f.o.b. Works

High-heat duty, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	$45.00
High-heat duty, New Jersey	50.00
High-heat duty, Ohio	40.00
Intermediate, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	40.00
Intermediate, New Jersey	43.00
Intermediate, Ohio	35.00
Ground fire clay, per ton	7.00

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	$45.00
Chicago District	54.00
Birmingham	$48 to 50.00
Silica cement per net ton	8.00

Chrome Brick

Per Net Ton

Standard f.o.b. Baltimore, Plymouth Meeting and Chester	$45.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	45.00

Magnesite Brick

Per Net Ton

Standard f.o.b. Baltimore and Chester, Pa.	$65.00
Chemically bonded, f.o.b. Baltimore	55.00

Grain Magnesite

Per Net Ton

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$21.50
F.o.b. Bethlehem, Birdsboro, and Swedeland, Pa., and Sparrows Point, Md.	20.50
Delivered Brooklyn	22.9289
Delivered Newark or Jersey City	21.9873
Delivered Philadelphia	21.3132
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	19.50
F.o.b. Jackson, Ohio	21.25
Delivered Cincinnati	19.82
F.o.b. Duluth	20.00
F.o.b. Provo, Utah	17.50
Delivered San Francisco, Los Angeles or Seattle	22.315
F.o.b. Birmingham*	15.88

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of .70 and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass.	$21.00
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	20.00
F.o.b. Buffalo	18.50
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	19.00
Delivered Cincinnati	18.82
Delivered Canton, Ohio	20.3482
Delivered Mansfield, Ohio	20.8832
F.o.b. Jackson, Ohio	20.75
F.o.b. Provo, Utah	17.00
F.o.b. Birmingham	14.50

Bessemer

F.o.b. Everett, Mass.	$22.50
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	21.50
Delivered Boston Switching District	23.00
Delivered Newark or Jersey City	22.9873
Delivered Philadelphia	22.3132
F.o.b. Buffalo and Erie, Pa., and Duluth	20.50
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	20.00
F.o.b. Birmingham	21.00
Delivered Cincinnati	21.0807
Delivered Canton, Ohio	21.3482
Delivered Mansfield, Ohio	21.8232

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$24.00

Gray Forge

Valley or Pittsburgh furnace	$19.00

Charcoal

Lake Superior furnace	$22.50
Delivered Chicago	25.7528

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	22.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)	$75.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	$26.00
50-ton lots 3-mo. shipment	24.00
F.o.b. New Orleans	26.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads)	$69.50
50% (ton lots)	77.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 6.00 to 6.50%	$22.75

For each additional 0.5% silicon up to 17%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton

10.00 to 10.50%	$27.75
10.51 to 11.00%	28.25
11.00 to 11.50%	28.75
11.51 to 12.00%	29.25
12.01 to 12.50%	29.75
12.51 to 13.00%	30.25
13.01 to 13.50%	30.75
13.51 to 14.00%	31.25
14.01 to 14.50%	31.75
14.51 to 15.00%	32.25
15.01 to 15.50%	32.75
15.51 to 16.00%	33.25
16.01 to 16.50%	33.75
16.51 to 17.00%	34.25

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	$1.30
Ferrotungsten, lots of 5000 lb.	1.35
Ferrotungsten, smaller lots	1.40
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract	10.00c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V.	$2.70 to $2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.	$2.50
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$137.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	142.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	58.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with $3 unitage, freight equalized with Nashville, Tenn.	75.00
Ferromolybdenum, per lb. Mo del.	95c.
Calcium molybdate, per lb. Mo del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads	$38.00
Ton lots or less, per ton	43.00
Silico-manganese, gross ton, delivered.	
2.50% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00

Note: Spot prices are $5 a ton higher except on 75 per cent ferrosilicon on which premium is $10 a ton.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$4.80
Old range, non-Bessemer, 51.50%	4.65
Mesabi, Bessemer, 51.50%	4.65
Mesabi, non-Bessemer, 51.50%	4.50
High phosphorus, 51.50%	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry Algeria	13.00c.
Iron, low phos., Swedish, average, 68½% iron	Nominal
Iron, basic or foundry, Swedish, aver. 65% iron	10.00c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	27c.
Man., African, Indian, 44-48%	25c.
Man., African, Indian, 49-51%	27.00c.
Man., Brazilian, 46 to 48½%	Nominal 25c.

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid delivered nominal	$15.25 to $15.50
Tungsten, domestic, scheelite delivered, nominal	15.00

Per Gross Ton

Chrome, 45% Cr_2O_3, lump, c.i.f. Atlantic Seaboard (African)	$17.50
45 to 46% Cr_2O_3 (Turkish)	$16.50 to 17.00
48% Cr_2O_3 (African)	20.50
48% min. Cr_2O_3 (Turkish)	19.25
Chrome concentrate, 50% and over Cr_2O_3, c.i.f. Atlantic ports	22.00
52% Cr_2O_3 (Turkish)	21.75
48 to 49% Cr_2O_3 (Turkish)	19.25

FLUORSPAR

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$18.00
Domestic, barge and rail	18.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	19.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	22.00
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	35.00

FUEL OIL

Per Gal.

F.o.b. Bayonne or Baltimore No. 3 distillate	4.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	3.75c.
Del'd Ch'go, No. 3 industrial	5.00c.
Del'd Ch'go, No. 5 industrial	3.77c.
Del'd Cleve'd, No. 3 distillate	6.00c.
Del'd Cleve'd No. 4 industrial	5.75c.
Del'd Cleve'd No. 5 industrial	5.00c.

COKE AND COAL

Coke

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	$3.75 to $4.00
Foundry, f.o.b. Connellsville, Prompt	4.25 to 5.75
Foundry, by-product, Chicago ovens	9.00
Foundry, by-product, del'd New England	11.50
Foundry, by-product, del'd Newark or Jersey City	9.60 to 10.05
Foundry, by-product, Philadelphia	9.38
Foundry, by-product, delivered Cleveland	10.30
Foundry, by-product, delivered Cincinnati	9.50
Foundry, Birmingham	6.50
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal

Per Net Ton

Mine run steam coal, f.o.b. W. Pa. mines	$1.50 to $1.75
Mine run coking coal, f.o.b. W. Pa.	1.75 to 1.90
Gas coal, ¾-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

THIS WEEK'S MACHINE . . . TOOL ACTIVITIES . . .

. . . Machine tool business holding up fairly well.

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. . . Volume of orders for turret lathes and automatic screw machines large.

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. . . St. Louis-Southwestern Railway to buy tools costing $128,450.

o o o

By L. M. WAITE

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A NOTEWORTHY incident of interest to the machine tool industry is the petition of the St. Louis-Southwestern Railway for court permission to buy shop equipment that will cost $128,450. The needs of the railroads for new equipment and the repair of old equipment have focused attention on the possibility that a number of roads may rehabilitate their shop equipment, much of which is very old.

In general, machine tool business has been holding up very well notwithstanding delays in some quarters owing to a desire to await the result of the national election before making fresh capital commitments. It is not believed that the election result will have any material effect on such business ultimately.

October sales of turret lathes by one important manufacturer were at a peak rate.

Cleveland

The volume of business in turret lathes and automatic screw machines is heavy. October was one of the best months in sales a leading local manufacturer of turret latnes ever had. Sales of automatic screw machines by a Cleveland manufacturer exceed shipments and deliveries are getting tighter. Shipments of some types are not promised before March. Business is well distributed among various industries and a small proportion is for export. Inquiries for drilling machinery, which have been light for some time, have improved.

Cincinnati

While a few projects are delayed because of election, this factor failed to retard the steady tool demand in this area the past week. Multiple unit orders for millers and grinders were reported, but other facts concerning these were not disclosed. Inquiry is brisk with all users showing definite interest in at least surveying present equipment in the light of possible replacements. No new planer business was reported, but averages on these heavy tools on a monthly basis indicate improvement. Contract planer work is steadily brisk. Factory operations show no change from last week.

Detroit

Although orders have been light during the past month, there have been two tooling programs amounting to several hundred thousand dollars each that have excited the attention of machinery suppliers. Packard is practically doubling its production on parts for its front wheel suspension on its two low-priced models and approximately half the needed equipment has been purchased to date. Final closure should take place this week and next. General Motors has been figuring on the manufacture of universal joints at one of its plants so as to supplement parts supplied from the outside. The tooling program is practically lined up, but no purchases have been made as yet. Ford Motor Co. is buying gear cutting equipment for its Daggenham, England, plant. General purpose equipment has been moving rather slowly in the last month.

St. Louis

The St. Louis-Southwestern Railway has petitioned United States District Judge Davis at St. Louis for authority to buy for cash heavy duty machinery for use in its shops at Pine Bluff, Ark., to cost $128,450. Judge Davis has set the petition down for hearing on Nov. 13. The list follows: One 8 hollow spindle turret lathe, to cost, $12,338. One vertical boring mill, $10,475. One 24 in. x 8 ft. engine lathe, $6500. One 90-in. driving wheel lathe, $33,800. One 800-ton wheel press, $8250. One No. 5 milling machine, $8400. One 54 in. x 6 in. x 18 ft. planer, $24,740. One 6-ft. radial drill, $8769. One 18 in. x 8 ft. lathe, $3700. One vertical milling machine, $5000. One 32 in. shaper, $3750. One oxygraph, $2500.

Side Shield Goggles

THE American Optical Co. announces an addition to its line of eye-protection equipment in Ful-Vue goggles with high-up end pieces, self-adjusting nose pads, Super Armorplate lenses and side shields. Special mesh, non-corrosive screens are easily cleaned and are said to offer no resistance to air circulation.

Steel Shipping Drums Are Stainless Lined

STAINLESS clad steel shipping containers, in capacities from 10 to 110 gal., are being fabricated by the Stevens Metal Products Co., Niles, Ohio. Possibilities of complete resistance to corrosion in shipping of a wide variety of products are emphasized by the makers. Designated as IngAclad, the stainless element is said to have a 20 per cent layer of 18-8 stainless steel inseparably bonded to soft steel. Drums comply with I.C.C., 5, 5B, and 6B regulations and are available in metal thicknesses from 18 to 12 gage and with either solid or removable heads.

Improved Pipe Clamps

REDESIGNED pipe clamps for stopping leaks in all types of industrial pipe lines, either high or low pressure, are being marketed by the M. B. Skinner Co., 3697 West Sample Street, South Bend, Ind. A gasket, sealed under heavy pressure, is said to be permanently effective in connection with steam, vapors or liquids. Application is simple and without shut-down. A recently installed testing equipment subjects each clamp to 3000 lb. pressure test.

PLANT EXPANSION AND EQUIPMENT BUYING

. . . American Can Co., New York, has acquired property at Houston, Tex., for branch plant costing $750,000 complete.

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. . . Atlas Powder Co., Wilmington, Del., has plans for new works to cost $1,000,000 with equipment.

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. . . International Harvester Co., Chicago, has let contract for branch plant at Indianapolis at total cost of $750,000.

NORTH ATLANTIC

American Can Co., 230 Park Avenue, New York, has acquired about 14-acre tract at Lockwood Street and Clinton Drive, Houston, Tex., for new branch plant, for which plans will be drawn soon under direction of C. W. Preis, company engineer, first noted address. It will include machine shop and other mechanical departments. Cost over $750,000 with equipment.

Air Reduction Sales Co., 60 East Forty-second Street, New York, has approved plans for one-story branch plant at Grand Rapids, Mich., for which superstructure will begin at once. Cost close to $75,000 with equipment. Company has also acquired for expansion plant of National Carbon Co., Jersey City, N. J., consisting of a large six-story building with two-story structure adjoining.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until Nov. 20 for 162,000 ft. of telephone cable and reels (Circular 72), coils (Circular 73).

American Enka Corp., 271 Church Street, New York, manufacturer of viscose rayon products, has let structural steel contract to Ingalls Iron Works Co., Birmingham, for one-story addition to mill at Enka, near Asheville, N. C., totaling about 100,000 sq. ft. floor space, and for building foundations to Potter & Shakleford, Inc., Greenville, S. C. Company will also build addition to power house, with installation of new 3000-kw. steam turbo-generator unit and auxiliary equipment. Entire project will cost over $350,000 with machinery.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 10 for acetylene welding torches (Schedule 9170), one electric arc welding set (Schedule 9211), 2170 cylinder regulators (Schedule 9197) for Brooklyn Navy Yard; until Nov. 17, steel wheelbarrows (Schedule 9148) for Brooklyn, Sewall's Point and Mare Island yards; gasoline fire pots, each one-gal. capacity (Schedule 9185) for Brooklyn, Sewall's Point and Puget Sound yards.

John Eichler Brewing Co., 3582 Third Avenue, New York, has acquired former plant of David Meyer Brewing Co., on adjoining site, totaling about 50,000 sq. ft. of land. Present buildings will be razed, and several new multi-story units erected for expansion in Eichler brewery. Cost over $150,000 with equipment.

Federal Bearings Co., Inc., Fairview Street, Poughkeepsie, N. Y., manufacturer of steel ball bearings, has let general contract to L. H. Swenson Co., Inc., 2 Cannon Street, for three-story and basement addition, 85 x 160 ft. Cost close to $80,000 with equipment. S. H. Chadwick, Poughkeepsie, is architect and engineer.

Superintendent of Lighthouses, St. George, Staten Island, New York, asks bids until Nov. 9 for 43 cast iron ballast balls, from 130 to 2000 lb. each; 184 cast iron sinkers, from 1890 to 8500 lb. each (Proposal 52447); until Nov. 12, wrought iron open-link buoy chain, from ¾ to 1⅝ in. diameter and 269 wrought iron bridle chains; total approximate weight, 959,260 lb. (Proposal 52450).

Eastern Steel Barrel Corp., Bound Brook, N. J., has acquired a new local one-story factory, 40,000 sq. ft. of floor space, heretofore held by Pierce Estates, Inc., and will occupy, expanding capacity. Henry Leeds is president.

Hoffman Beverage Co., 402 Grove Street, Newark, N. J., plans addition to steam power house at soft drink plant and brewery, 25 x 55 ft. Cost close to $50,000 with equipment. Company will take bids at once for four-story and basement addition to brewery division, primarily for storage and distribution. Cost about $150,000 with equipment. Epple & Kahrs, 17 Washington Street, are architects and engineers for both projects.

Harr Keg Tap Beer Equipment Co., Newark, Herman Harr, president, recently organized to manufacture mechanical-cooling equipment and systems for dispensing beer direct from kegs, has leased two floors in building at 109-23 Frelinghuysen Avenue, about 10,000 sq. ft. floor space, for plant with facilities for employment of about 150 persons.

Commanding Officer, Ordnance Department, Philadelphia, asks bids until Nov. 9 for one automatic metallic arc welding machine (Circular 214), one comparator gage, bench type (Circular 199).

Atlas Powder Co., Delaware Trust Building, Wilmington, Del., manufacturer of industrial chemicals, plastics, etc., has plans for new plant on 163-acre tract on River Road, between Wilmington and New Castle, Del., for production of new line of special industrial chemicals, to include power house, machine shop and other mechanical departments. Cost close to $1,000,000 with machinery. E. W. Maynard is vice-president in charge of industrial chemicals department.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 17 for aircraft tachometers (Schedule 9184) for Philadelphia Navy Yard.

NEW ENGLAND

Stanley Works, Inc., Lake and Burritt Streets, New Britain, Conn., manufacturer of steel specialties, etc., has let general contract to Torrington Building Co., Torrington, Conn., for one-story addition, 75 x 275 ft. Cost over $100,000 with equipment.

United States Engineer Office, First District, New York, asks bids until Nov. 9 for ¾ and ⅞-in. wire rope for Waterbury, Vt. (Circular 79).

Board of School Trustees, Malden, Mass., plans manual training department in new two-story and basement senior high school. Cost about $1,000,000. Financing is being arranged through Federal aid. Desmond & Lord, 1 Beacon Street, Boston, are architects.

Wiremold Co., Elmwood, Conn., manufacturer of electrical cables, conduits, fittings, etc., has let general contract to R. F. Jones Co., 15 Lewis Street, Hartford, Conn., for two-story addition, 90 x 105 ft. Cost close to $40,000 with equipment.

Winchester Repeating Arms Co., Winchester Avenue, New Haven, Conn., plans addition to steam power house. Cost about $50,000 with equipment. Arthur L. Nelson Engineers, 31 St. James Avenue, Boston, are consulting engineers.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 17 for about 11,000 lb. brass boat fittings (Schedule 9183) for Boston, Mare Island and Puget Sound yards.

Tilo Roofing Co., Stratford, Conn., manufacturer of prepared roofing products, has asked bids on general contract for one and two-story addition, 100 x 160 ft. Cost over $75,000 with equipment. Fletcher-Thompson, Inc., 1336 Fairfield Avenue, Fairfield, Conn., is architect and engineer.

BUFFALO DISTRICT

Kimberly-Clark Corp., Niagara Falls, N. Y., manufacturer of book and kindred paper stocks, has let general contract to Wright & Kremers, Inc., Pine Avenue and Main Street, for five-story mill addition. Cost close to $275,000 with equipment. Company headquarters are at Neenah, Wis.

United States Engineer Office, Federal Building, Buffalo, asks bids until Nov. 9 for steel boiler tubes for upright boiler unit (Circular 28); until Nov. 16, ½-in. link chains, crane type (Circular 26).

Carborundum Co., Niagara Falls, N. Y., has plans for one-story addition, primarily for storage and distribution. Improvements will also be made to three-story building on adjoining site. Cost close to $65,000 with equipment.

WASHINGTON DIST.

Poole Foundry & Machine Co., Union Avenue, Woodberry, Baltimore, manufacturer of gears, couplings, special machinery and parts, has asked bids on general contract for one-story addition. Cost about $30,000 with equipment. Harry L. Katz, 3212 Gwynns Falls Parkway, is architect.

General Purchasing Officer, Panama Canal, Washington, asks bids until Nov. 9 for swing-type double and single steel doors, steel windows, cold-drawn steel boiler tubes, grounding clamps, valves and other equipment (Schedule 3194); until Nov. 16, one air compressor, metal traffic signs, screw jacks, galvanized wire rope clips, bronze sash chain, 15,000 sq. ft. galvanized steel wire cloth, 12,000 lin. ft. galvanized steel wire poultry netting, 6000 lin. ft. copper wire cloth, copper tacks, brass wire gate hooks and eyes, brass

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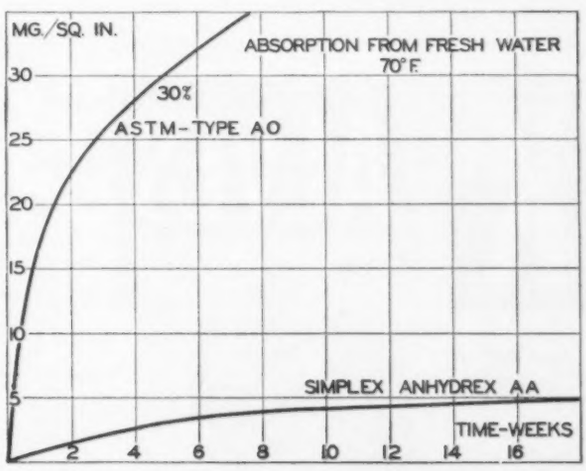

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G. W. Forsberg, Eighth and Water Streets, S.W., Washington, manufacturer of machinery and parts, has let general contract to Fred Drew Co., Inc., 2539 Pennsylvania Avenue, N.W., for one-story addition and improvements in present plant. Cost about $35,000 with equipment. P. Remsen, 126 Chestnut Avenue, Tacoma Park, Md., is consulting engineer.

Commanding Officer, Nansemond Ordnance Depot, Portsmouth, Va., asks bids until Nov. 11 for one ½-ton electric chain hoist and trolley (Circular 22).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 10 for one motor-driven broaching machine (Schedule 9210), one motor-driven generator unit and accessories (Schedule 9209), 16 bench type comparators, combination of mechanical gaging, with optical and mechanical magnifications (Schedule 9208) for Washington yard; electric cable (Schedule 9135); until Nov. 13, machinists' and scaling hammers (Schedule 122); until Nov. 17, about 400 drill chucks (Schedule 9158), anchor shackles, sail thimbles and wire rope (Schedule 9203), ratchet braces and breast drills (Schedule 9204), about 3800 hack saw frames (Schedule 9191), 155 ¼ to 3-ton chain hoists (Schedule 9189), about 600 lubricating guns (Schedule 9192) for Eastern and Western yards.

SOUTH ATLANTIC

International Harvester Co., 606 South Michigan Avenue, Chicago, will ask bids soon on general contract for one-story addition to branch plant for motor truck division at Atlanta, Ga. Cost over $40,000 with equipment.

District Quartermaster, Fort Barrancas, Fla., asks bids until Nov. 18 for one 3000-gal. galvanized corrugated sheet metal tank (Proposal 5401-29).

Fruehauf Trailer Co., 496 Courtland Street, N.E., Atlanta, Ga., manufacturer of motor trailers and parts, with main plant at Detroit, has plans for one-story factory branch, storage, distributing and service plant, 75 x 100 ft., at Piedmont and Harris Streets, N.E., Atlanta. Cost over $35,000 with equipment. E. C. Seiz, 119 Luckie Street, N.W., is architect.

Steel Products Co., Savannah, Ga., manufacturer of heavy motor trailers, tank cars, etc., has plans for one-story addition on Lathrop Avenue. Cost over $30,000 with equipment.

SOUTH CENTRAL

United States Engineer Office, Vicksburg, Miss., asks bids until Nov. 9 for one gasoline engine-driven electric generating set (Circular 99).

Kraft-Phenix Cheese Corp., 400 Rush Street, Chicago, plans one-story milk products processing plant at Winnsboro, Tenn., where site has just been selected, to include power house, machine shop and other mechanical units. Cost about $85,000 with machinery. Company is affiliated with National Dairy Products Corp., New York.

Kentucky Power & Light Co., Augusta, Ky., plans expansion and improvement in steam-operated electric generating plant at Maysville, Ky., including new 2500-kw. generator unit and auxiliary equipment. Cost close to $100,000 with equipment.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until Nov. 12 for guide rail supports for spillway gates for Pickwick Landing dam, consisting of stainless steel and structural steel sections, and other metal work; also until Nov. 17, one 300-ton overhead electric traveling crane for power plant at Pickwick Landing dam.

Common Council, Glasgow, Ky., plans new municipal electric light and power plant. Cost about $200,000 with equipment. Bond issue in amount noted is being arranged.

Summit Textile Co., Summit, Miss., plans new steam power house at mill. Cost about $30,000 with boilers, pumps and other equipment.

SOUTHWEST

Nixdorff-Klein Mfg. Co., 900 Howard Street, St. Louis, manufacturer of forgings and other iron and steel products, has let general contract to Fruin-Colnon Contracting Corp., Merchants Laclede Building, for one-story and basement addition, 90 x 140 ft. Cost about $40,000 with equipment.

Hutchinson Coca-Cola Bottling Co., 728 South Main Street, Hutchinson, Kan., has plans for two-story addition to mechanical bottling works, 70 x 150 ft. Cost over $45,000 with equipment. Mann & Co., Wiley Building, are architects.

United States Engineer Office, Manufacturers' Exchange Building, Kansas City, asks bids until Nov. 23 for one 4½-cu. yd. dredge dipper (Circular 213).

Consumers' Rural Power Co., Kingfisher, Okla., recently organized, plans transmission and distributing lines for rural electrification in parts of Kingfisher, Blaine, Canadian and neighboring counties, about 750 miles, with power substations and service facilities. Cost close to $800,000. Initial fund of $300,000 has been secured through Federal aid for first section.

North American Electric Lamp Co., 1151 South Broadway, St. Louis, has leased building at Eleventh and Tyler Streets and will remodel for expansion.

Board of Education, Chanute, Kan., plans vocation training department for new three-story and basement high school and junior college, for which bids will be asked soon on general contract. It will replace a school unit destroyed by fire several months ago. Cost about $220,000. D. B. Peterson, 721 Minnesota Avenue, Kansas City, Kan., is architect.

Lucey Petroleum Co., Continental Building, Dallas, Tex., plans new oil refinery near Talco, Tex., oil field district, where site is being acquired. It will include division for gasoline production, steel storage tank department, power house, pumping station and other mechanical structures. Cost about $350,000 with machinery.

Riona Products Co., McAllen, Tex., fruit canner, plans two one-story additions to canning plant, one for a dehydration unit for processing present waste material for livestock feed. Cost over $75,000 with machinery. Lee Akin is general manager.

WESTERN PA. DIST.

Pittsburgh Coal Co., Oliver Building, Pittsburgh, plans installation of additional coal-mining and operating machinery at bituminous coal-mining properties in western Pennsylvania. Cost close to $1,000,000.

H. J. Heinz Co., 1062 Progress Street, Northside, Pittsburgh, food products, has asked bids on general contract for one-story factory branch, storage and distributing plant, 70 x 140 ft., with two-story extension, 30 x 70 ft., at Miami, Fla. Cost over $60,000 with equipment. Taylor & Baxter, Congress Building, Miami, are engineers.

Owens-Illinois Glass Co., Ohio Building, Toledo, Ohio, has acquired about 12-acre tract near Seventh Street and Washington Boulevard, Huntington, W. Va., for additions to local plant in that district, including storage and distributing buildings. An additional furnace is planned. Entire project will cost over $100,000 with equipment.

OHIO AND INDIANA

American Stove Co., 1200 Long Avenue, Cleveland, manufacturer of stoves and ranges, parts, etc., plan one-story addition, for which bids are expected to be asked soon on general contract. Cost over $75,000 with equipment.

Superior Die Casting Co., 875 East Seventieth Street, Cleveland, has leased part of former plant of Cleveland Automobile Co., Euclid Avenue and London Road, N.E., totaling over 27,000 sq. ft. of floor space, about double that of present plant, and will remove to new location.

Lackner Co., York Street and Western Avenue, Cincinnati, manufacturer of signs and displays, has asked bids on general contract for two-and-one-half-story and basement plant, 100 x 150 ft. Cost over $50,000 with equipment. J. R. Biedinger, Traction Building, is consulting engineer.

Sedlacek Mfg. Co., West Forty-seventh Street and Storer Avenue, Cleveland, manufacturer of mechanical specialties, machine parts, etc., has acquired three-story building at 3909 Clark Avenue, S.W., totaling about 40,000 sq. ft. floor space, and will remodel for expansion. Present works will be removed to new location.

Village Council, Lowellville, Ohio, plans municipal electric power plant, using diesel engine-generator unit and auxiliaries. Cost about $50,000. Bryan & Sigman Engineer-

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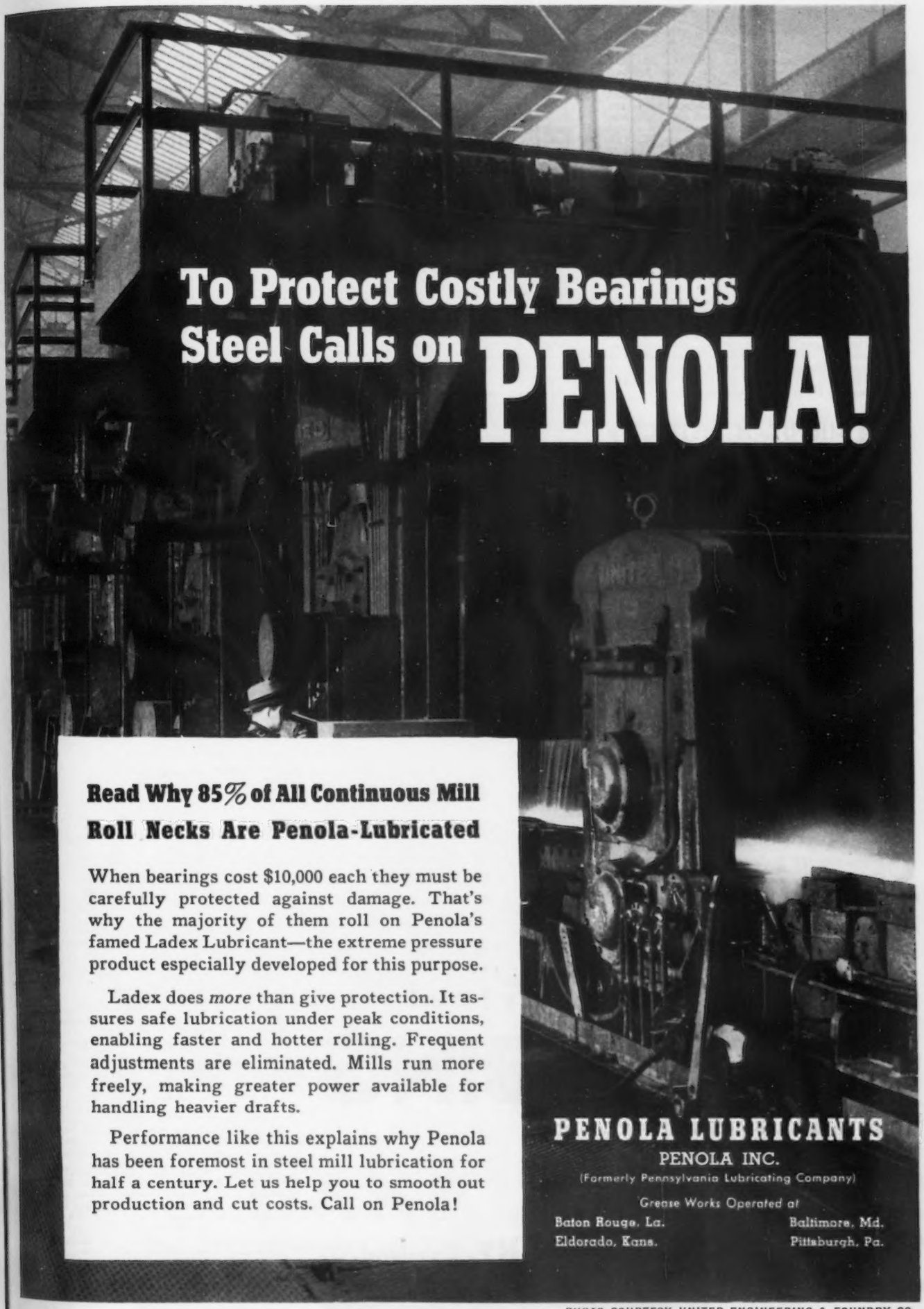
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LUBRICATION FOR THE STEEL INDUSTRY • 1885 TO 1936

ing Co., Newton Falls, Ohio, are consulting engineers.

Contracting Officer, Material Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until Nov. 11 for fuel cock stem drill jibs, cock control shims, cock control pins, shim gages, control washers, control cams, control yokes, etc. (Circular 284); until Nov. 12, 230 gun control switch assemblies (Circular 292); until Nov. 20, 265 fixed gun sight assemblies (Circular 282); until Dec. 4, lead assemblies, antenna mast assemblies, change-over junction box assemblies, outlet shield assemblies, conduit, conduit clamps, motor-generators, assembled power units, cable and kindred equipment (Circular ARL-11).

Indianapolis Power & Light Co., Electric Building, Indianapolis, has taken out permit for one-story machine shop, 118 x 146 ft., at 1230 West Morris Street. Cost over $60,000 with equipment.

Link-Belt Co., 220 South Belmont Street, Indianapolis, manufacturer of elevating and conveying machinery, etc., has awarded general contract to Service Construction Co., Castle Hall Building, for one-story addition to Ewart Works, used primarily for production of chains and malleable iron castings. Cost close to $40,000 with equipment. Main offices are at Chicago.

MICHIGAN DISTRICT

Kellogg Co., Battle Creek, Mich., manufacturer of cereal foods, has asked bids on general contract for three multi-story additions. Cost over $350,000 with equipment. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

Huron Forge & Machine Co., Pontiac, Mich., manufacturer of forgings, sheet metal stampings, conveying machinery, etc., has let general contract to Patterson Engineering Co., 8044 Wheeler Street, Detroit, for one-story addition. Cost close to $40,000 with equipment. Harry S. Angell, Transportation Building, Detroit, is architect.

L. A. Young Spring & Wire Corp., 9200 Russell Avenue, Detroit, has acquired about 10-acre tract on East State Street Extension, Trenton, N. J., for Eastern branch plant. Initial unit will be one-story, 250 x 500 ft., with several smaller buildings. Cost over $400,000 with equipment. Building award will be made during November.

Brown City Mfg. Co., Brown City, Mich., recently organized to manufacture iron castings and kindred iron products for agricultural equipment parts, etc., has acquired local site and will soon begin erection of one-story foundry, machine shop and general storage and distributing building. Cost over $40,000 with equipment.

Gar Wood Industries, Inc., Highland Park, Mich., manufacturer of mechanical equipment, machinery and parts, has begun erection of one-story addition, exclusively for road-building machinery division. Cost close to $50,000 with equipment. C. W. Wood is plant manager.

MIDDLE WEST

Mall Tool Co., 7740 South Chicago Avenue, Chicago, manufacturer of flexible shaft machinery, parts, etc., has let general contract to Rune & Sons, 6760 Stony Island Avenue, for one-story addition, 67 x 105 ft. Cost about $45,000 with equipment. Robert S. Smith, 111 West Munroe Street, is architect.

Briskin Mfg. Co., 4243 West Ogden Street, Chicago, manufacturer of sheet metal products, has plans for one-story addition. Cost about $30,000 with equipment.

International Harvester Co., 606 South Michigan Avenue, Chicago, has let general contract to William P. Jungclaus Co., 825 Massachusetts Avenue, Indianapolis, for new one-story factory branch, service, storage and distributing plant, 260 x 664 ft., on 2½-acre tract at Indianapolis, recently acquired. Cost about $750,000 with equipment.

Iowa Packing Co., East Eighteenth and Maury Streets, Des Moines, Iowa, meat packer, affiliated with Swift & Co., Chicago, has asked bids on general contract for addition to main packing plant, and improvements in present units. Cost about $400,000 with equipment.

United States Engineer Office, Fort Peck, Mont., asks bids until Nov. 9 for arc welding electrode holders and 900 springs, 1800 spring insulating washers (Circular 209); until Nov. 10, drill rods and drill bits (Circular 213), three circular saws, inverted tooth type (Circular 212).

Minneapolis & St. Louis Railroad Co., Minneapolis, plans rebuilding part of coal-loading plant at Olds, Iowa, recently destroyed by fire. Loss close to $30,000 with equipment.

Oakes Products Corp., North Chicago, Ill., manufacturer of pressed steel automotive products, has let general contract to E. C. Green, Waukegan, Ill., for one-story addition, 40 x 130 ft. Cost over $40,000 with equipment. Ekstrand & Schad, 100 South Genesee Street, Waukegan, are architects. Company is a unit of Houdaille-Hershey Corp., Detroit.

PACIFIC COAST

Christie Machine Works, 222 Howard Street, San Francisco, manufacturer of machinery and parts, has let general contract to George Wagner, 181 South Park Street, for one-story plant unit. Cost about $45,000 with equipment. Dodge A. Reidy, 821 Market Street, is architect; W. H. Ellison, Pacific Building, is engineer.

Pacific Coast Envelope Co., Wilcox Building, Los Angeles, manufacturer of paper products, has plans for two-story factory, about 40,000 sq. ft. of floor space, on East Twelfth Street, for main paper-converting plant. Cost close to $90,000 with machinery. Austin Co., 777 East Washington Boulevard, is architect and engineer, and will receive general building award.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 10 for following motor-driven machines: One engine lathe (Schedule 9138); until Nov. 18, one hack saw (Schedule 9177) for Mare Island Navy Yard; one engine lathe (Schedule 9171) for Puget Sound yard; until Nov. 10, one pipe and bolt threading and cutting machine (Schedule 9142) for San Diego yard; until Nov. 17, one radial drill and spare parts (Schedule 9196), two milling machines and spare parts (Schedule 9199), one bench-type precision lathe and spare parts (Schedule 9198) for Puget Sound yard; two four-wheel type industrial tractors (Schedule 9214) for San Diego Navy Yard; 20 electric-operated floor polishing and scrubbing machines (Schedule 9187) for Mare Island yard.

Magnus Co., 3074 N.W. St. Helens Street, Portland, Ore., manufacturer of metal products, has let general contract to A. J. Bingham, Couch Building, for one-story foundry addition. Cost close to $30,000 with equipment.

California Electric Steel Mills, Inc., Los Angeles, A. C. Denman, 407 Van Nuys Building, representative in charge, has plans for new steel products plant at Watts near Los Angeles, comprising several one-story units, totaling close to 40,000 sq. ft. of floor space. Cost about $100,000 with equipment.

Williams & Co., 911 North Monroe Street, Portland, Ore., manufacturers of food products, has let general contract to Shattuck & Neland, Couch Building, for one-story and basement plant unit, 100 x 115 ft. Cost close to $80,000 with equipment. F. Marion Stokes, Terminal Sales Building, is architect.

FOREIGN

Daimler Co., Ltd., Coventry, England, manufacturer of automobiles, has approved plans for new works for manufacture of aircraft engines and parts on adjoining tract of about seven acres. It will comprise several one-story units for parts production, assembling, testing, storage and distribution, with facilities for employment of about 1000 men. Cost over $2,000,000 with equipment. It will be operated in conjunction with Air Ministry of Government for engines for military planes.

Dominion Steel Co., Ltd., Sydney, N. S., plans expansion and improvements, including several one-story additions with two large car-loading plant units. New equipment will be installed, including an electric furnace with accessory equipment for production of special grades of steel, new electric equipment in rod mill and other machinery. Cost about $300,000.

Noranda Power Co., Ltd., Royal Bank Building, Toronto, a subsidiary of Noranda Mines, Ltd., same address, plans hydro-electric generating plant on Upper Ottawa River, near Grand Lake Victoria, Que., about 75 miles from gold and silver mining properties of parent organization at Noranda, Que. Plant will have initial capacity of 30,000 hp., and will be used for power requirements for mining operations. A transmission line will be built to Noranda and vicinity. Entire project will cost about $5,000,000.

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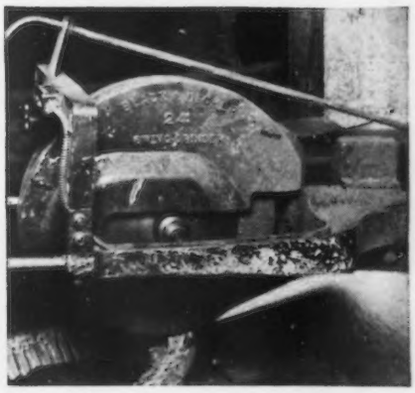

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BONDED WHEELS

FOR ECONOMICAL HIGH SPEED GRINDING

Steel Castings for the "Queen Mary"

(CONCLUDED FROM PAGE 46)

as would be surmised, much of this metal is of the highest grade that can now be produced commercially.

While many of the steel parts made in the foundry (including stainless metal) and used for constructing the "Queen Mary" have not been mentioned in this article, probably it will be clear to the landsman that great reliance has been placed on steel castings for building what was intended to be the last word in ship construction, from the standpoint of speedy, comfortable transportation of several thousand people carried on each voyage across the sea. The element of speed which is a significant feature of the "Queen Mary's" regular performance presented problems for the shipbuilder which necessitated the selection of materials that would resist stresses of enormous severity; as when it may be required to turn the ship suddenly and sharply from its course, when traveling at approximately 35 miles per hour, for avoiding collision.

Summing up, it must be evident to any one who is informed of the facts herein stated, that the steel casting industry has received, through the construction and performance of the "Queen Mary," a tribute that carries much significance for many engineers who require metal parts to regularly perform heavy duty, and to have adequate strength and toughness for resisting suddenly imposed stresses of exceptional severity.

Permanent Mold Castings of Aluminum

(CONCLUDED FROM PAGE 52)

Permanent mold aluminum castings can be made with sections as thin as 7/64 in., just a shade thicker than a section feasible in a die casting. Almost any combination of properties can be obtained in permanent mold aluminum castings—high strength, high hardness, low expansion (high silicon content) and strength at elevated temperatures, such as would be required in pistons for high compression motors. Washing machine agitators are made of S.A.E. No. 33 alloy containing 6 to 8 per cent copper, 2.5 per cent zinc, 1.5 per cent iron and 2 per cent zinc. This is one of the most widely used alloys.

Typical of the high-strength, heat-treated alloys is S.A.E. No. 38, extensively used for outboard motor parts not only because of its strength, but also because of its resistance to salt spray corrosion. Strengths from 40,000 to 55,000 lb. per sq. in. can be obtained with permanent mold castings, according to heat treatment. In comparison, the No. 33 alloy has a tensile strength of not less than 23,000 lb. when cast in a permanent mold; 19,000 in sand. The No. 38 alloy contains the following percentages: 4 to 5 copper, 1.2 silicon, 1.2 iron, 0.3 max. manganese, 0.2 max. zinc, 0.05 max. magnesium. Other impurities are held down to 0.20 per cent.

With a material having such wide possibilities and a technique that does not impose too great a die or mold expense, we are bound to see further developments in the application of permanent mold castings of aluminum.

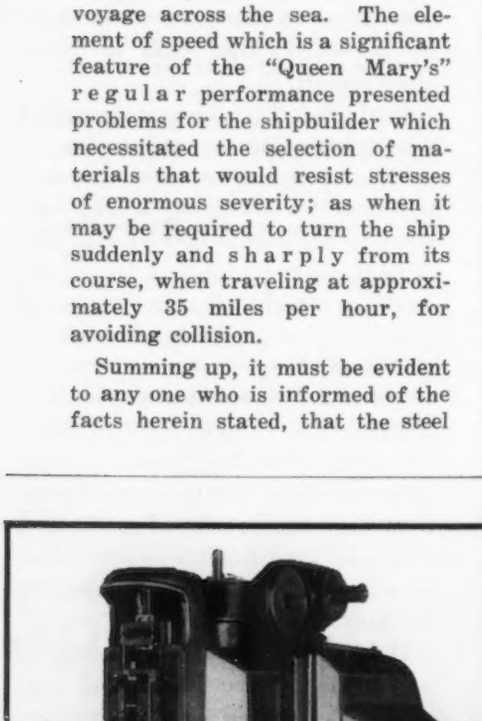
Role of the Fabricator

(CONCLUDED FROM PAGE 54)

training and education of the steel salesmen, because a specialist could not be sent from the mill to work with every customer fabricator who was only in the early stages of his interest in the new alloy. The mild interest stage was too widespread for that.

The first questions and preconceived objections to the metal raised by the prospective customer could be at least partially answered by the better trained stainless salesman regularly calling on him and he could be led farther along the path of his growing interest without the salesman having to shout for an expert from the home office, of whom there are always too few. Later when the customer had been induced to place a trial order and had run into some real problem of fabrication, whether in making a watch case, a piece of chemical equipment, a stair railing, or what not, he could depend upon the supplier of the material to work with him continuously until the troublesome problem was solved.

This procedure to a very large extent is what has given the stainless industry the measure of success it has attained.



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JUST BETWEEN US TWO

Mea Culpa

NO one can outdo us in registering abject sorrow and uttering profuse apologies for an error. We beat our chest until it is literally black and blue.

There is, of course, method in this. Probably we publish, page for page, more information than any other trade paper in the country, and ought to be allowed an error every now and then, but nevertheless we are loudly contrite, hoping that will earn us early and complete forgiveness.

Usually it does. But there are exceptions. For example, take the war-time case of the small plant which we reported to have been seriously damaged by fire. It seems that we exaggerated a trifle. It was only singed.

The owner was sore. You couldn't blame him. We were sorry and published a correction. That was eighteen years ago. You would think time would have healed the wound. But it hasn't. We saw him only the other day, and he is still sore. There ought to be a time limit on grudges the same as there is on debts.

Necking

KEATS it was, we believe, who gnawed his quill for days on end searching for just the right word. The writer of an article in *Advertising Agency* on the relative intelligence of men and women apparently hit on the perfect metaphor right smack off the bat:

> *"In general intelligence . . . women are just as well equipped as men. . . . Only in the early teens do girls have a slight edge on boys in general intelligence. By the time they are well into high school, however, the boys have caught up, and from then on the sexes are neck and neck. . . ."*

Pat-Ronym

A CLEVELAND manufacturer of house trailers has named his product the "Homobile." A natural.

Small Miracle

A GENERAL magazine salesman called on one of our Pacific Coast subscribers last week. For some reason or other, the subscriber paid him $6 cash for his current year's subscription. We got the money, but this is risky business.

Our own representatives can readily identify themselves. If there is any doubt, don't pay cash. You cannot possibly suffer loss if you make out a check to The Iron Age, for if it is cashed by anyone but us, the cashee or endorser must make good.

Blurb

WE are given to loing and beholding at intervals on the incredible heterogeneity of products made by Iron Age subscribers. Our excuse this time is the diversity of products on last week's list of new subscribers. They make carousels, bake pots, jack screws, metal beds, radiator shields, sewing machines, cotton gins, airplane parts, dust collectors, brake drums, stove pipe, woven wire, warm air furnaces, casement hardware, water softening systems, files, chewing gum machines—to mention a few.

All are made of metal and are fabricated with metal-working equipment. Our advertisers are, we hope, happy that their wares are being exposed to such a wide and diversified market.

Slightly Off

WE learned a new word the other day—arithmomania. It means an uncontrollable desire to count things. Sherlock Holmes had it. You will recall he panned his stooge, Dr. Watson, for not knowing how many steps in his own front porch.

People who can tell you how many buttons on a vest, how many jiggers in a fifth, how many pickets in their backyard fence, etc., are mildly psychopathic. Most of us have a touch of it.

Our weakness is counting the number of regular advertisers in The Iron Age. At the moment there are 559; a year ago we had 473, the year before that 403, the previous year 377. We could go on like that for seconds, but you get the idea.

—A. H. D.

Pat'd and Pats. Pending

"HALLOWELL" STEEL WORK BENCH
Fig. 732

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These benches are made in standard lengths from 3 to 10 feet—continuous benches can be furnished any size. They're shipped knocked down, but all nuts, bolts and washers come with it. It's all there, ready to assemble when you receive it.

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—are of the same high quality and fine construction as the work benches. A one piece welded unit that stays rigid. They're scientifically designed for maximum comfort and efficiency. The line is so complete, your requirements can be filled exactly. Want our Catalog?

Fig. 1334

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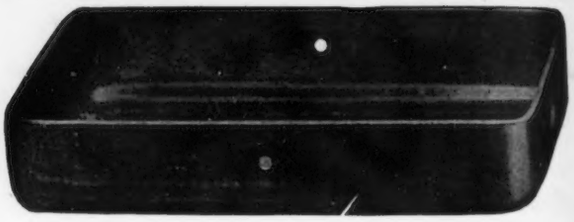

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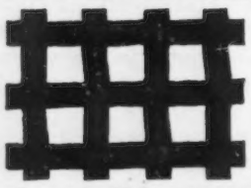

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